

Knox Business Park

NOISE IMPACT ANALYSIS COUNTY OF RIVERSIDE

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09349-30 Noise Study



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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANFO	Ammonium nitrate/fuel oil
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
Leq	Equivalent continuous (average) sound level
Lmax	Maximum level measured over the time interval
Lmin	Minimum level measured over the time interval
MM	Mitigation measure
mph	Miles per hour
OSMRE	Office of Surface Mining Reclamation and Enforcement
PPV	Peak particle velocity
Project	Knox Business Park
RCNM	Roadway Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
STC	Sound Transmission Class
VdB	Vibration Decibels



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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Knox Business Park development ("Project"). The Project site is located on the southeast corner of Decker Road and Oleander Avenue in unincorporated County of Riverside. The Project is proposed to consist of approximately 1,114,022 square feet of high-cube warehouse/distribution center uses divided over two buildings: Building D (703,040 square feet) and Building E (410,982 square feet). The purpose of this noise analysis is to ensure that the proposed development is compatible with the existing and future noise environment. This study has been prepared to satisfy the County of Riverside noise standards and to ensure that adequate noise abatement measures are incorporated into the Project's development.

OFF-SITE TRAFFIC NOISE ANALYSIS

Traffic generated by the proposed Project will influence the traffic noise levels in surrounding offsite areas. To quantify the off-site traffic noise increases on the surrounding off-site areas, the changes in traffic noise levels on 12 roadway segments surrounding the Project site were estimated based on the change in the average daily traffic (ADT) volumes. The traffic noise levels provided in this analysis are based on the traffic forecasts found in the *Knox Business Park Traffic Impact Analysis* prepared by Urban Crossroads, Inc. in June 2015. (1) To assess the off-site noise level impacts associated with the proposed Project, noise contour boundaries were developed for Existing, Year 2017, and Year 2035 traffic conditions. The off-site traffic noise analysis indicates that the Project's contributions to roadway noise levels at adjacent land uses will be *potentially significant* under Existing and Year 2017 conditions. However, these *potentially significant* impacts will be considered *less than significant* impacts by Year 2035 traffic conditions.

The Project-related increases must be compared with the cumulative noise level increases without the Project to determine if the Project noise level increases represent a *cumulatively considerable* impact. The Project's actual contribution to the cumulative noise level increases will range from 0.2 to 1.9 dBA CNEL, and will not exceed the *barely perceptible* significance threshold of 3 dBA or more for non-noise-sensitive land uses along the study area roadway segments. Therefore, since the Project-related off-site traffic noise level increases represent a *less than significant* contribution to the overall cumulative noise impacts at the adjacent land uses, the Project-related traffic noise level increases are *less than cumulatively considerable*.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the noise sources from the Knox Business Park site, this analysis estimates the Project-related operational stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Knox Business Park are anticipated to include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. With the recommended noise mitigation measures (MM), presented below, the operational noise analysis shows that the stationary-source noise levels due to the idling trucks, delivery truck activities, parking, backup alarms, as well as loading



and unloading of dry goods will not exceed the County of Riverside General Plan Noise Element noise level standards at the sensitive receivers adjacent to the Project site.

Further, this analysis demonstrates that the Project will not contribute an operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods, will be *less than significant*.

CUMULATIVE OPERATIONAL NOISE ANALYSIS

To account for potential cumulative stationary-source noise impacts, cumulative developments in the Project study area were identified. The cumulative developments used in this analysis are consistent with those identified in the *Knox Business Park Traffic Impact Analysis*. (1) Each development's potential stationary noise sources were estimated based on their planned land use designation, and the stationary-source noise levels are determined using reference noise level measurements of similar land uses taken by Urban Crossroads, Inc.

The cumulative operational noise analysis shows that the cumulative development-related noise level contributions represent *less than significant* impacts during daytime conditions, and *significant* impacts during nighttime conditions. The cumulative nighttime noise level increases will range from 0.1 to 13.8 dBA Leq. Based on the significance criteria in Section 4, the cumulative noise level increases represent a *potentially significant* cumulative impact at receiver locations R1, and R3 to R5 during the nighttime hours. Since the Project-related nighttime noise level increases are *less than significant* and range from 0.0 to 0.8 dBA Leq, they represent a *less than cumulatively considerable* increase to the overall cumulative noise impacts. Further, the Project-related nicrease of 0.8 dBA is less than the *barely perceptible* 3 dBA increase identified in the significance criteria previously described in Section 4.

OPERATIONAL NOISE MITIGATION MEASURES

With the noise mitigation measures (MM) recommended below, the normal operation of the Project will not exceed the County of Riverside standards for stationary-source noise impacts. As shown by this analysis, the recommended 8-foot high noise barriers will reduce the noise levels at receiver location R6 by 11 dBA to satisfy the County of Riverside General Plan Noise Element 45 dBA Leq nighttime noise level standards. It is recommended that the Lead Agency require the following as Project Conditions of Approval:

MM Noise-1:

- Construct 8-foot high noise barriers at the southern property line of the Building D site at the topof-slope elevation, as shown on Exhibit 9-A.
- All on-site operating equipment under the control of the building user that is used in outdoor areas (including but not limited to trucks, tractors, forklifts, and hostlers), shall be operated with properly functioning and well-maintained mufflers.
- Maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.



- Should any of the buildings within the Project include special noise generators, such as outdoor compressors, air scrubbers, heavy materials handlings, HVAC units, emergency generators, or outdoor amplification (speakers), the following shall be required as conditions of the occupancy permit:
 - An acoustical study shall be required to determine the noise impacts, if any, to nearby sensitive receivers due to special noise generators and recommend any necessary noise mitigation measures.
 - The study shall analyze the noise levels received at adjacent sensitive land uses to satisfy the appropriate jurisdiction's noise level standards; and
 - The study shall determine the significance of noise level contributions from the operation of special noise generators based on the significance criteria below when the ambient noise levels at nearby sensitive receivers:
 - are less than 60 dBA and the project creates a *readily perceptible* 5 dBA or greater project related noise level increase; or
 - range from 60 to 65 dBA and the project creates a *barely perceptible* 3 dBA or greater project noise level increase; or
 - already exceed 65 dBA, and the project creates a community noise level impact of greater than 1.5 dBA.
 - The study shall identify the noise attenuation measures needed to meet the above performance standards, and Riverside County shall require the implementation of such measures.
- The truck access gates and loading docks within the truck court on the Project site shall be posted with signs which state:
 - Truck drivers shall turn off engines when not in use;
 - Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and
 - Post telephone numbers of the building facilities manager to report violations.

CONSTRUCTION NOISE AND VIBRATION ANALYSIS

Construction noise represents a short-term increase on the ambient noise levels. Constructionrelated noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the Project site boundary. Using sample reference noise levels to represent the planned construction activities of the Knox Business Park site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. With the recommended minimum 6-foot high temporary noise control barrier at the southern Project site boundary, the mitigated construction noise levels will satisfy the County of Riverside 65 dBA Leq construction noise level threshold at the nearby sensitive receivers. Therefore, the construction of the Project will result in a *less than significant* impact after mitigation with the recommended temporary noise control barrier.

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. This analysis shows the construction vibration levels in RMS are expected to



approach 0.003 in/sec (RMS) at the eight receiver locations. Based on the County of Riverside vibration standards of 0.01 in/sec (RMS), the proposed Project construction activities will not include or require equipment, facilities, or activities that would result in a *barely perceptible* human response (annoyance), and therefore, impacts due to vibration are considered *less than significant*.

BLASTING NOISE AND VIBRATION IMPACTS

The worst-case blasting activities associated with Project construction are expected to include 15 sections of approximately 400 holes per blast over a two-month period. This equates to roughly 15 separate blasting events. Using conventional blasting methods, there will be one blast near the edge of the southern property line using holes as deep as 15 to 20 feet. The explosive charges are placed in each hole to fragment the rocks into smaller, crushable pieces. The charges will be made up of ammonium nitrate/fuel oil (ANFO) which consists of 94 percent ammonium nitrate and 6 percent diesel fuel. Further, the blasts will be single-event noise sources which occur over a few seconds, with multiple small blasts in each hole occurring milliseconds apart from each other. Once the blast is completed, normal construction grading activities will resume. An electric rock crusher will later break down the fragmented rocks at the Project site and will be powered by a 300-horsepower diesel generator. The noise and vibration levels expected due to blasting activities during Project construction are discussed below.

Since the County of Riverside General Plan and Municipal Code do not identify specific construction noise level limits for blasting activities, the Office of Surface Mining Reclamation and Enforcement (OSMRE) and the Code of Federal Regulations (CFR) Airblast Limits (30 CFR 816.67(b)) are used. Section 816.2 of Title 30 of the CFR indicates that the blasting regulations are intended to ensure that all surface mining activities are conducted in a manner which preserves and enhances environmental and other values in accordance with the Act. (2) While the OSMRE regulates mining activities, the blasting activities at the Project site represent surface mining activities which, to satisfy California Environmental Quality Act (CEQA) guidelines, must demonstrate that they do not adversely affect the existing environment. Therefore, the OSMRE blasting regulations are applied to the blasting activities anticipated at the Project site. For mining operations, which require larger blasts than that of the Project, the lowest noise level threshold identified in the CFR is a maximum noise level 129 dBA Lmax for blasting activity measured at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area... (2) The Lmax threshold used in the noise analysis is suitable for single-event noise levels, such as blasting activities, since other noise regulations in Leg (energy average), for example, average out a reference noise level over a given time period which reduces the single-event noise level over a longer period of time. The Lmax, therefore, allows for the shorter-duration single-event noise levels to be evaluated against an appropriate threshold.

Using a reference noise level for explosive blasting measured by Urban Crossroads, Inc. of 81.5 dBA Lmax at 370 feet, the blasting noise levels at the nearby sensitive residential homes were calculated. Based on the reference blasting noise level of 81.5 dBA Lmax at 370 feet, the closest residential receiver at 191 feet to the Project site will experience noise levels approaching 80.5



dBA Lmax over the course of the blast, which will likely occur for only a few seconds. While some blasting noise may be noticeable by nearby residents, the single-event, temporary noise levels generated by the blast will not exceed the OSMRE and the CFR standards for airblasts, and therefore, will result in a *less than significant* noise impact.

Further, the blasting contractor shall design the blasts when located within 200 feet of existing residential structures to reduce vibration velocity levels from each blast below the Caltransidentified damage threshold of 3.0 in/sec. (3) A blast signal shall be used to notify nearby residents that blasting is about to occur. Lastly, all complaints must be responded to and investigated as they occur. The major source of vibration due to rock blasting is expected to be from the charges placed in each drill hole within the Project site. Due to the ability of the blasting contractor to limit the ground-borne vibration levels, the vibration velocity levels at 191 feet to the nearest sensitive receiver are expected to be *less than significant*.

CONSTRUCTION NOISE AND VIBRATION MITIGATION MEASURES

Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following practices would reduce any noise level increases produced by the construction equipment to the nearby noise-sensitive residential land uses:

MM Noise-2:

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities that would create noise levels of greater than 45 dBA Leq at sensitive receivers shall only occur between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. The Project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.
- Install a minimum 6-foot high temporary noise control barrier, as shown on Exhibit 10-A, at the southern Project site boundaries near receiver location R6. The noise control barrier must present a solid face from top to bottom. The noise control barrier must be a minimum height of 6-feet.
 - The noise barrier may be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts.
 - The noise barriers must be maintained and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired.
 - The noise control barriers and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.



- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site (i.e., to the center) during all Project construction.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May). The contractor shall prepare a haul route exhibit and shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.
- The following blasting noise and vibration monitoring and abatement plan shall be adopted and submitted to the County prior to commencement of blasting activities:
 - Pre-blasting inspections shall be offered to property owners within 200 feet of the blast site.
 - Existing damage of each structure shall be documented.
 - Post-blasting inspections shall be offered to assess new or additional damage to each structure once blasting activities have ceased for those property owners who accepted pre-blast inspections.
 - Property owners within at least 200 feet of the blast site shall be notified via postings on the construction site at least 24 hours before the occurrence of major constructionrelated noise and vibration impacts (such as grading and rock blasting) which may affect them.
 - The County may impose conditions and procedures on the blasting operations as necessary. The construction contractor shall comply with these measures for the duration of the blasting permit. The County may inspect the blast site and materials at any reasonable time (County of Riverside Ordinance No. 787).



1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Knox Business Park ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Knox Business Park site is located south of Oleander Avenue and on either side of Decker Road in unincorporated County of Riverside, as shown on Exhibit 1-A. The Project site is mostly vacant with one vacant structure within the southern portion of the site. Nearby existing residential land uses are located west and south of the Project site. An existing high-cube warehouse/distribution land use is located northeast of the Project site along Oleander Avenue.

1.2 PROJECT DESCRIPTION

The Project is proposed to consist of approximately 1,114,022 square feet of high-cube warehouse/distribution center uses divided over two buildings: Building D (703,040 square feet) and Building E (410,982 square feet), as shown on Exhibit 1-B. Access to Building E would be provided via two proposed driveways on Oleander Avenue. The western driveway would provide access to passenger cars only and the eastern driveway would provide access to trucks only. It is our understanding that a 3rd driveway may potentially provide access to passenger cars only and would be located approximately mid-point between the western and eastern driveways for Building E. At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. This analysis does not account for the noise associated with tenants that require cold storage (refrigeration).

According to the *Knox Business Park Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 2,155 trip-ends per day (actual vehicles) with 138 AM peak hour trips and 151 PM peak hour trips. (1) The net Project trip generation includes 806 truck trip-ends per day with 38 AM peak hour truck trips and 50 PM peak hour truck trips. While the traffic volumes presented in the *Knox Business Park Traffic Impact Analysis* are expressed as Passenger Car Equivalent (PCE) trips, the Knox Business Park Noise Impact Analysis relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

Business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, and the loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. This analysis does not account for any special noise generators that may be needed to accommodate the



needs of specific Knox Business Park building tenants. Special noise generators may consist of outdoor compressors, air scrubbers, heavy materials handlings, HVAC units, emergency generators, etc. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site.



EXHIBIT 1-A: LOCATION MAP









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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE	
THRESHOLD OF PAIN		140			
NEAR JET ENGINE		130	INTOLERABLE OR		
		120	DEAFENING	HEARING LOSS	
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110			
LOUD AUTO HORN		100			
GAS LAWN MOWER AT 1m (3 ft)		90			
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80			
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	SPEECH INTERFERENCE	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60			
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	CLEED	
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		DISTURBANCE	
QUIET SUBURBAN NIGHTTIME	LIBRARY	30			
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20	FAINT		
	BROADCAST/RECORDING STUDIO	10		NO EFFECT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0			

EXHIBIT 2-A: TYPICAL NOISE LEVELS

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (4) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA



at approximately 100 feet, which can cause serious discomfort. (5) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (Leq). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA Leq sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of Riverside relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source.

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually



sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source.

2.3.3 ATMOSPHERIC EFFECTS

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 ft) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby resident. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure.

2.4 TRAFFIC NOISE PREDICTION

Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires on the roadway. Per the *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, provided by the Federal Highway Administration (FHWA), the level of traffic noise depends on three primary factors: the volume of the traffic, the speed of the traffic, and the vehicle mix within the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and a greater number of trucks. (6) A doubling of the traffic volume, if the speed and vehicle mix do not change, results in a noise level increase of 3 dBA. The vehicle mix on a given roadway may also influence community noise levels. As the number of medium and heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise level impacts will increase.





2.5 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to these three elements.

2.6 Noise Barrier Attenuation

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (6)

2.7 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (7)

2.8 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (8) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of



one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (8)

Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (6)





2.9 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (9), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

Vibration is usually expressed in peak particle velocity (PPV) in inches per second (in/sec) and discussed in decibel (dB) units to compress the range of numbers required to describe vibration. Vibration impacts are generally associated with activities such as train operations, construction, and heavy truck movements. Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response (annoyance). It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude often described as the root-mean-square (RMS). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a 1-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to reduce the range of numbers used to describe human response to vibration.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and



distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-B illustrates common vibration sources and the human and structural response to ground-borne vibration.

Human/Structural Response	Velocity Level*		ty *	Typical Sources (50 ft from source)	
Threshold, minor cosmetic damage fragile buildings		100	-	Blasting from construction projects	
Difficulty with tasks such as reading a VDT screen	→	90	•	Bulldozers and other heavy tracked construction equipment	
5			-	Commuter rail, upper range	
Residential annoyance, infrequent events (e.g. commuter rail)	-	80	-	Rapid transit, upper range	
oronio (o.g. commuter ran)			-	Commuter rail, typical	
Residential annoyance, frequent events (e.g. rapid transit)		70	÷	Bus or truck over bump Rapid transit, typical	
Limit for vibration sensitive equipment. Approx. threshold for human perception of vibration	-	60	•	Bus or truck, typical	
		50	←	Typical background vibration	
		\bigcirc			

EXHIBIT 2-B: TYPICAL LEVELS OF GROUND-BORNE VIBRATION

* RMS Vibration Velocity Level in VdB relative to 10⁻⁶ inches/second Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research. (10) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2014 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.506 on Environmental Comfort. (11) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA Leq for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).



3.3 COUNTY OF RIVERSIDE GENERAL PLAN NOISE ELEMENT

The County of Riverside has adopted a Noise Element of the General Plan to control and abate environmental noise, and to protect the citizens of the County of Riverside from excessive exposure to noise. The Noise Element identifies two separate types of noise sources: (1) transportation and (2) stationary, and establishes guidelines for acceptable transportation and stationary community noise levels in the County of Riverside General Plan. (12)

3.3.1 TRANSPORTATION NOISE STANDARDS

The Noise Element specifies the maximum noise levels allowable for new developments impacted by transportation noise sources such as arterial roads, freeways, airports, and railroads. For the purposes of this Project, the noise impacts associated with traffic are controlled by the General Plan Noise Element. The County General Plan standards are derived from standards contained in the General Plan Guidelines, a publication of the California Office of Planning and Research prepared in October, 2003. These standards are used by many California cities and counties. The Noise Element includes standards for land use compatibility for community noise exposure. For single family residential areas, the exterior noise levels should remain below 65 dBA CNEL, and the interior noise levels should remain below 45 dBA CNEL.

For industrial uses, the *Land Use Compatibility for Community Noise Exposure* matrix sets guidelines per the predicted noise exposure level. Exhibit 3-A presents the General Plan *Land Use Compatibility for Community Noise Exposure* matrix. Per the noise compatibility matrix, an ambient noise level of up to 75 dBA CNEL is considered *normally acceptable* for the development of industrial uses.

LAND USE CATEGORY	COMMUNITY	Y NOI	ISE EX	POSURI	E LEVEI	L Ldn or	CNEL, dBA
		55	60	65	70	75	80
Posidontial I ow Donsity	F	1	-1		1	1	1
Single Family Duplay Mabile	Homes	1		-			
Single Failing, Duplex, Mobile	e nomes		1			11/2	
Residential-Multiple Family		1	-				
		I		T			
Transient Lodging-Motels, Ho	otels	1					
			-	1			
Schools, Libraries, Churches,	Hospitals,						
Nursing Homes				1		_	
Auditoriums, Concert Halls, A	Amphitheaters						
					T	1	1
		I					
Sports Arena, Outdoor Specta	ator Sports	1		1	-		
						4	
		I					
Playgrounds, Neighborhood H	Parks	-	-				
					T		
		I					
Golf Courses, Riding Stables,	Water Recreation	I	-		_		
Cemeteries	mater recercation,					-	
		I					
Office Buildings, Businesses,	Commercial,	1	-	- 1			
and Professional						-	
		I					
Industrial, Manufacturing, U	tilities,						
Agriculture				- 1			_
Legend:		1		1	1		
Normally Acceptable:	Conditionally Assesstables	No	mally Una	ccentable	_	Clearly I	Inaccontables
Specified land use is satisfactory based upon the assumption that any buildings involved are	New construction or development should be	New	construction or scouraged. If m	development shoul	i generally	New constru	ction or development should be undertaken. Construction
of normal conventional construction, without any special noise insulation requirements.	the noise reduction requirements is made and needed noise insulation features included in	does	proceed, a detai	iled analysis of the i nts must be made w	th needed	costs to make	the indoor environment ould be prohibitive and the
Source: California Office of Noise Control	the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem poise	Outc	r insulation featu loor areas must b	ares included in the be shielded.	design.	outdoor envi	ronment would not be usable.

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE

Source: County of Riverside General Plan Noise Element, Table N-1.



3.3.2 STATIONARY NOISE STANDARDS

The County of Riverside has set exterior noise limits to control idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods associated with projects like the proposed Knox Business Park. The County considers noise generated by the use of motor vehicles to be a stationary noise source when operated on private property such as at a truck terminal or warehousing facility. These facility-related noises, as projected to any portion of any surrounding property containing a *habitable dwelling, hospital, school, library or nursing home*, must not exceed the following worst-case noise levels.

Policy N 4.1 of the Noise Element sets an exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA Leq for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA Leq during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. These stationary-source noise level standards are consistent with the County of Riverside Office of Industrial Hygiene guidelines for noise studies within the County. Policy N 4.8 of the Noise Element requires that loading docks of industrial land uses minimize the potential noise impacts of vehicles on the site, as well on the adjacent land uses. (12) The County of Riverside operational noise standards used in this analysis are shown on Table 3-1.

Jurisdiction	Land Use	Time Period	Exterior Noise Level Standards (dBA Leq) ²	
County of	Desidential	Daytime (7:00 a.m 10:00 p.m.)	65	
Riverside ¹	Residential	Nighttime (10:00 p.m 7:00 a.m.)	45	

TABLE 3-1: OPERATIONAL NOISE STANDARDS

¹ Source: County of Riverside General Plan Noise Element, Table N-2.

² Leq represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

3.4 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the County has established limits to the hours of operation. Section 9.52.020 of the County's Noise Regulation ordinance, provided in Appendix 3.1, indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (13) Neither the County's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*.

To allow for a quantified determination of what the Noise Control Ordinance constitutes as noise that *may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life* due to Project construction activity, relevant quantified stationary



source noise standards established in the General Plan, Policy N 4.1, are used in this analysis to assess the Project construction noise levels at nearby sensitive receivers. Therefore, the daytime noise level standard of 65 dBA Leq is used to evaluate the potential Project-related construction noise impacts. (12)

3.5 CONSTRUCTION VIBRATION STANDARDS

The County of Riverside does not have vibration standards for temporary construction, but the County's General Plan Noise Element does contain the human reaction to typical vibration levels. Vibration levels with peak particle velocity of 0.787 inches per second are considered readily perceptible and above 0.1968 in/sec are considered annoying to people in buildings. Further, County of Riverside General Plan Policy 15.3 identifies a motion velocity perception threshold for vibration due to passing trains of 0.01 inches per second (in/sec) over the range of one to 100 Hz. (12) For the purposes of this analysis, the perception threshold of 0.01 in/sec shall be used to assess the potential impacts due to Project construction at nearby sensitive receiver locations.

3.5.1 HUMAN PERCEPTION OF VIBRATION

Typically, the human response at the perception threshold for vibration includes annoyance in residential areas as previously shown on Exhibit 2-B, when vibration levels expressed in vibration decibels (VdB) approach 75 VdB. The County of Riverside, however, identifies a vibration perception threshold of 0.01 in/sec. For vibration levels expressed in velocity, the human body responds to the average vibration amplitude often described as the root-mean-square (RMS). The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a one-second period. As with airborne sound, the RMS velocity is often expressed in decibel notation as vibration decibels (VdB), which serves to reduce the range of numbers used to describe human response to vibration. Therefore, the County of Riverside vibration standard of 0.01 in/sec in RMS velocity levels is used in this analysis to assess the human perception of vibration levels due to Project-related construction activities.

3.6 BLASTING REGULATIONS

The construction of the proposed Project will include blasting of hard rock areas, which is a major source of potential noise and vibration impacts to nearby residential receivers. Since the County of Riverside General Plan and Municipal Code do not identify specific construction noise level limits for blasting activities, the Office of Surface Mining Reclamation and Enforcement (OSMRE) and the Code of Federal Regulations (CFR) *Airblast Limits* (30 CFR 816.67(b)) are used. Section 816.2 of Title 30 of the CFR indicates that the blasting regulations are *intended to ensure that all surface mining activities are conducted in a manner which preserves and enhances environmental and other values in accordance with the Act.* (2) While the OSMRE regulates mining activities, the blasting activities at the Project site represent surface mining activities which, to satisfy California Environmental Quality Act (CEQA) guidelines, must demonstrate that they do not adversely affect the existing environment. Therefore, the OSMRE blasting regulations are applied to the blasting activities anticipated at the Project site. For mining operations, which require larger blasts than that of the Project, the lowest noise level threshold identified in the CFR is a



maximum noise level 129 dBA Lmax for blasting activity measured at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area... (2) The Lmax threshold used in the noise analysis is suitable for single-event noise levels, such as blasting activities, since other noise regulations in Leq (energy average), for example, average out a reference noise level over a given time period which reduces the single-event noise level over a longer period of time. The Lmax, therefore, allows for the shorter-duration single-event noise levels to be evaluated against an appropriate threshold.

The Caltrans *Transportation and Construction Vibration Guidance Manual* vibration velocity levels for various building materials susceptibility to damage are used to evaluate the potential vibration impacts due to blasting at the Project site. For residential structures, the threshold of damage for vibration is approximately 3.0 in/sec (PPV) for cosmetic cracking and damage. (3)



4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project is determined to result in or cause:

- A. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- B. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
- C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or
- D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed Project.

While the CEQA Guidelines and the County of Riverside General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under the first threshold, they do not define the levels at which increases are considered substantial for use under the second, third and fourth threshold.

4.1 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers in order to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (14)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (15) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL).



For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4.1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

Without Project Noise Level	Potential Significant Impact		
< 60 dBA	5 dBA or more		
60 - 65 dBA	3 dBA or more		
> 65 dBA	1.5 dBA or more		

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Federal Interagency Committee on Noise (FICON), 1992.

4.2 NON-NOISE-SENSITIVE RECEIVERS

The County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area, such as Business Park and Industrial land uses. As previously shown on Exhibit 3-A, the *normally acceptable* exterior noise levels for non-noise-sensitive land uses is 70 dBA CNEL. Noise levels greater than 70 dBA CNEL are considered *conditionally acceptable* per the *Land Use Compatibility for Community Noise Exposure*. (12)

To determine if Project-related traffic noise level increases are significant at off-site non-noisesensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria were used. When the without Project noise levels at the non-noise-sensitive land uses are below the *normally acceptable* 70 dBA CNEL compatibility criteria, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the *normally acceptable* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds s for noise-sensitive land uses but instead rely on the County of Riverside General Plan Noise Element, Table N-1, *Land Use Compatibility for Community Noise Exposure normally acceptable* 70 dBA CNEL exterior noise level criteria. Table 4.2 provides a summary of the noise impact significance criteria.



Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
 - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project related noise level increase; or
 - range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project noise level increase; or
 - already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. business park, industrial, etc.):
 - are less than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project related noise level increase; or
 - are greater than the County of Riverside General Plan Noise Element, Table N-1, normally acceptable 70 dBA and the Project creates a barely perceptible 3 dBA or greater Project noise level increase.

OPERATIONAL NOISE

- If Project-related operational (stationary source) noise levels exceed the exterior 65 dBA Leq daytime or 45 dBA Leq nighttime noise level standards at nearby sensitive residential land uses (County of Riverside General Plan, Policy N 4.1).
- If the cumulative operational (stationary source) noise levels at nearby noise-sensitive receivers near the Project site:
 - are less than 60 dBA and the project creates a *readily perceptible* 5 dBA or greater project related noise level increase (Cumulatively Considerable Impact); or
 - range from 60 to 65 dBA and the project creates a *barely perceptible* 3 dBA or greater project noise level increase (Cumulatively Considerable Impact); or
 - already exceed 65 dBA, and the project creates a community noise level impact of greater than 1.5 dBA (Cumulatively Considerable Impact).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
 - occur at any time other than the permitted hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May (County of Riverside Municipal Code, Section 9.52.020) and would create noise levels of greater than 45 dBA Leq at sensitive receivers;
 - create noise levels which exceed the County of Riverside 65 dBA Leq acceptable noise level threshold at the nearby sensitive receiver locations (Based on the County of Riverside General Plan, Policy N 4.1).



- If short-term Project generated construction vibration levels exceed the County of Riverside acceptable vibration standard of 0.01 in/sec (RMS) at sensitive receiver locations (County of Riverside General Plan, Policy N 15.3).
- If noise due to blasting exceeds the Office of Surface Mining Reclamation and Enforcement and Code of Federal Regulations, Section 30 CFR 816.67(b), *Use of Explosives: Control of Adverse Effects* lowest maximum noise level standard of 129 dBA Lmax at nearby sensitive receiver locations.
- If vibration due to blasting exceeds 3.0 in/sec (PPV) at nearby sensitive receiver locations (Caltrans *Transportation and Construction Vibration Guidance Manual*).

Noise		Condition(s)	Significance Criteria			
Analysis	Land Use	Condition(s)	Daytime	Nighttime		
		if ambient is < 60 dBA CNEL ≥ 5 dBA CNEL Project increase				
	Noise- Sensitive	if ambient is 60 - 65 dBA CNEL \geq 3 dBA CNEL Project increase				
Off-Site		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL	Project increase		
	Non-	if ambient is < 70 dBA CNEL	≥ 5 dBA CNEL F	roject increase		
	Sensitive	if ambient is > 70 dBA CNEL	≥ 3 dBA CNEL F	roject increase		
		Exterior residential land use	65 dBA Leq	45 dBA Leq		
Onerational	Noise- Sensitive	if ambient is < 60 dBA Leq	it is < 60 dBA Leq \geq 5 dBA Leq Project increase			
Operational		if ambient is 60 - 65 dBA Leq	ent is 60 - 65 dBA Leq \geq 3 dBA Leq Project increase			
		if ambient is > 65 dBA Leq \geq 1.5 dBA Leq Project increase				
		Permitted hours of 6:00 a.m. an June through September, and 7 months of October through May	d 6:00 p.m., during :00 a.m. and 6:00 p y	the months of .m., during the		
Construction	Noise-	Noise level threshold	65 dBA Leq	45 dBA Leq		
Construction	Sensitive	Vibration level threshold	0.01 in/sec (RMS)	n/a		
		Blasting Noise Threshold	129 dBA Lmax	n/a		
		Blasting Vibration Threshold	3.0 in/sec (PPV)	n/a		

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.; "n/a" = No nighttime construction activity is permitted and therefore, no nighttime construction noise level threshold is identified.



5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, seven 24-hour noise level measurements were taken at sensitive receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. from Tuesday, March 31st to Wednesday, April 1st, 2015. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (16)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned at the nearest sensitive receiver locations to assess the existing ambient hourly noise levels surrounding the Project site. To describe the existing noise environment, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential cumulative noise impacts.







A Noise Measurement Locations


5.3 NOISE MEASUREMENT RESULTS

To describe the existing ambient noise environment, the noise measurements presented below focus on the average or equivalent sound levels (Leq). The equivalent sound level (Leq) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels along at the northwest corner of Corson Avenue and Day Street near existing residential homes, northwest of the Project site. The noise level measurements collected show an overall 24-hour exterior noise level of 58.4 dBA CNEL. The hourly noise levels measured at location L1 ranged from 44.5 to 63.6 dBA Leq during the daytime hours and from 41.8 to 47.5 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 56.4 dBA Leq with an average nighttime noise level of 45.2 dBA Leq.
- Location L2 represents the noise levels along Day Street south of Burch Street at existing residential homes located west of the Project site. The noise level measurements collected show an overall 24-hour exterior noise level of 61.2 dBA CNEL. The hourly noise levels measured at location L2 ranged from 51.6 to 63.7 dBA Leq during the daytime hours and from 45.3 to 54.3 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 58.2 dBA Leq with an average nighttime noise level of 51.7 dBA Leq.
- Location L3 represents the noise levels southwest of the Project site along Nance Street adjacent to existing residential homes. The 24-hour CNEL indicates that the overall exterior noise level is 57.6 dBA CNEL. At location L3 the background ambient noise levels ranged from 39.6 to 63.3 dBA Leq during the daytime hours to levels of 39.7 to 46.3 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 56.1 dBA Leq with an average nighttime noise level of 57.6 dBA Leq.
- Located at the future southwest property line of Building D, location L4 represents the existing noise levels adjacent to existing residential homes along Redwood Drive. The noise level measurements collected show an overall 24-hour exterior noise level of 56.8 dBA CNEL. The hourly noise levels measured at location L4 ranged from 40.8 to 61.8 dBA Leq during the daytime hours and from 42.6 to 47.2 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 55.9 dBA Leq with an average nighttime noise level of 44.6 dBA Leq.
- Location L5 represents the noise levels on Old Oleander Avenue, northeast of the Project site near an existing cell tower with electrical generators and a residential home. The noise level measurements collected show an overall 24-hour exterior noise level of 66.5 dBA CNEL. The hourly noise levels measured at location L5 ranged from 57.3 to 67.3 dBA Leq during the daytime hours and from 51.4 to 62.6 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 63.0 dBA Leq with an average nighttime noise level of 58.2 dBA Leq.
- Location L6 represents the noise levels at the northwest corner of Markham Street and Decker Road near existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 68.2 dBA CNEL. The hourly noise levels measured at location L6



ranged from 60.8 to 65.9 dBA Leq during the daytime hours and from 53.2 to 64.2 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 63.7 dBA Leq with an average nighttime noise level of 60.6 dBA Leq.

Location L7 represents the noise levels along Markham Street near existing residential homes, south of the Project site. The 24-hour CNEL indicates that the overall exterior noise level is 73.9 dBA CNEL. At location L7 the background ambient noise levels ranged from 66.0 to 72.1 dBA Leq during the daytime hours to levels of 59.7 to 69.5 dBA Leq during the nighttime hours. The energy (logarithmic) average daytime noise level was calculated at 69.5 dBA Leq with an average nighttime noise level of 66.3 dBA Leq.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides a summary of the hourly noise levels for each hour as well as the minimum and maximum noise level observed during the daytime and nighttime period. The background ambient noise levels in the Project study area are dominated by the transportation related noise associated with the arterial roadway network and March Air Reserve Base. This includes auto, heavy truck, and aircraft activities near the noise level measurement locations. Secondary background ambient noise is also included in the noise level measurements from existing stationary noise sources in the Project study area, such as the existing high-cube warehouse/distribution center use northeast of the Project site along Oleander Avenue. The 24-hour existing noise level measurements shown on Table 5-1 present the worst-case existing ambient noise conditions.



Location ¹	Distance To Project	Description	Hourly No (dBA	oise Level Leq) ²	CNEL
	Site Boundary		Daytime	Nighttime	
[1]	1,920'	Located at the northwest corner of Corson Avenue and Day Street near existing residential homes.	56.4	45.2	58.4
٢3	1,770'	Located along Day Street south of Burch Street near existing residential homes.	58.2	51.7	61.2
L3	225'	Located southwest of the Project site along Nance Street adjacent to existing residential homes.	56.1	42.9	57.6
L4	-0	Located at the future southwest property line of Building D, adjacent to existing residential homes on Redwood Drive.	55.9	44.6	56.8
L5	1,074'	Located on Old Oleander Avenue, northeast of the Project site near an existing cell tower with electrical generators and residential home.	63.0	58.2	66.5
91	1,285'	Located at the northwest corner of Markham Street and Decker Road near existing residential homes.	63.7	60.6	68.2
٢٦	1,282'	Located along Markham Street near existing residential homes, south of the Project site.	69.5	66.3	73.9
L		-			

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

¹ See Exhibit 5-A for the noise level measurement locations.
² Energy (logarithmic) average hourly levels. The long-term 24-hour measurement printouts are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.



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6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (17) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (18) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

6.2 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the 12 study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the County of Riverside General Plan Circulation Elements, and the posted vehicle speeds. For the purpose of this analysis, soft site conditions were used to analyze the traffic noise impacts within the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation.

The Existing, Year 2017, and Year 2035 average daily traffic volumes used for this study are presented on Table 6-2 and were provided by the *Knox Business Park Traffic Impact Analysis* prepared by Urban Crossroads, Inc. (1) Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits.



ID	Roadway	Segment	Adjacent Planned Land Use ¹	Distance from Centerline to Nearest Adjacent Land Use (Feet) ²	Posted Vehicle Speed (MPH)
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	59'	50
2	Harvill Av.	n/o Oleander Av.	Business Park	59'	50
3	Harvill Av.	s/o Oleander Av.	Business Park	59'	50
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	85'	65
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	85'	65
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	85'	65
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	85'	65
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	76'	45
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	76'	45
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	76'	45
11	Oleander Av.	e/o Driveway 6	Business Park	50'	40
12	Oleander Av.	w/o Harvill Av.	Business Park	50'	40

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

¹ Source: County of Riverside General Plan, Mead Valley Area Plan Land Use Plan, Figure 3.

² Distance to adjacent land use is based upon the right-of-way distances for each functional roadway classification provided in the General Plan Circulation Elements.

				Avera	age Daily 1	Traffic (1,0	00s)1	
ID	Poodwov	Formant	Exis	ting	Year	2017	Year	2035
	KUduway	Segment	No	With	No	With	No	With
			Project	Project	Project	Project	Project	Project
1	Harvill Av.	s/o Harley Knox Bl.	9.7	11.5	11.9	13.7	23.6	25.4
2	Harvill Av.	n/o Oleander Av.	9.1	10.9	11.7	13.5	23.6	25.4
3	Harvill Av.	s/o Oleander Av.	8.8	9.1	10.9	11.2	28.6	28.9
4	I-215 SB Fwy	n/o Harley Knox Bl.	38.6	38.6	51.0	51.0	68.6	68.6
5	I-215 SB Fwy	s/o Harley Knox Bl.	34.5	34.9	47.4	47.8	62.4	62.8
6	I-215 NB Fwy	n/o Harley Knox Bl.	32.5	33.7	44.7	45.9	69.4	70.6
7	I-215 NB Fwy	s/o Harley Knox Bl.	27.8	27.8	34.9	34.9	52.9	52.9
8	Harley Knox Bl.	e/o Harvill Av.	9.9	11.7	12.5	14.3	34.0	35.8
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	12.2	13.6	22.0	23.4	28.0	29.4
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	15.6	15.8	31.0	31.2	36.4	36.6
11	Oleander Av.	e/o Driveway 6	0.1	2.2	0.1	2.2	6.6	8.7
12	Oleander Av.	w/o Harvill Av.	0.5	2.6	0.5	2.6	6.6	8.7

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

¹ Source: Knox Business Park Traffic Impact Analysis, Urban Crossroads, Inc., June 2015.



		Time of Day Splits		Total Of
Vehicle Type	Daytime	Evening	Nighttime	Time Of Day Splits
Autos	77.5%	12.9%	9.6%	100.0%
Medium Trucks	84.8%	4.9%	10.3%	100.0%
Heavy Trucks	86.5%	2.7%	10.8%	100.0%

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Source: County of Riverside Office of Industrial Hygiene.

"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

According to the *Knox Business Park Traffic Impact Analysis* prepared by Urban Crossroads, Inc., the Project is expected to generate a net total of approximately 2,155 trip-ends per day (actual vehicles) with 138 AM peak hour trips and 151 PM peak hour trips. (1) The net Project trip generation includes 806 truck trip-ends per day with 38 AM peak hour truck trips and 50 PM peak hour truck trips. While the traffic volumes presented in the *Knox Business Park Traffic Impact Analysis* are expressed as Passenger Car Equivalent (PCE) trips, the Knox Business Park Noise Impact Analysis relies on the net Project trips to accurately account for the effect of individual truck trips on the study area roadway network.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.

The 806 daily Project truck trip-ends trucks were assigned to the 12 individual off-site study area roadway segments based on the estimated Project truck trip distribution percentages. Using the Project truck trips in combination with the Project trip distribution, it is possible to calculate the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Tables 6-4 to 6-6 describe the distribution of traffic flow by vehicle type (vehicle mix) by roadway segment for each of the off-site Project traffic conditions.



				No Pr	oject ¹			With Pi	roject ²	
₽	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total	Autos	Medium Trucks	Heavy Trucks	Total
1	Harvill Av.	s/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	88.14%	2.37%	9.48%	100.00%
2	Harvill Av.	n/o Oleander Av.	93.82%	1.09%	5.09%	100.00%	87.83%	2.45%	9.72%	100.00%
3	Harvill Av.	s/o Oleander Av.	93.82%	1.09%	5.09%	100.00%	93.59%	1.15%	5.27%	100.00%
4	I-215 SB Fwy	n/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.82%	1.09%	5.09%	100.00%
S	I-215 SB Fwy	s/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.44%	1.17%	5.39%	100.00%
9	I-215 NB Fwy	n/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	92.36%	1.42%	6.23%	100.00%
7	I-215 NB Fwy	s/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.82%	1.09%	5.09%	100.00%
8	Harley Knox Bl.	e/o Harvill Av.	93.82%	1.09%	5.09%	100.00%	88.24%	2.35%	9.41%	100.00%
6	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	93.82%	1.09%	5.09%	100.00%	90.01%	1.95%	8.04%	100.00%
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	93.82%	1.09%	5.09%	100.00%	93.66%	1.12%	5.21%	100.00%
11	Oleander Av.	e/o Driveway 6	93.82%	1.09%	5.09%	100.00%	63.33%	8.04%	28.63%	100.00%
12	Oleander Av.	w/o Harvill Av.	93.82%	1.09%	5.09%	100.00%	68.00%	6.98%	25.03%	100.00%
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TABLE 6-4: EXISTING CONDITIONS TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

¹ Source: Based on existing PM peak hour classification counts by vehicle type taken by Urban Crossroads, Inc. on 4/15/2015 at Harvill Avenue and Harley Knox Boulevard. ² Source: Knox Business Park Traffic Impact Analysis, Urban Crossroads, Inc., June 2015.



				No Pr	oject ¹			With Pi	oject²	
Q	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total	Autos	Medium Trucks	Heavy Trucks	Total
1	Harvill Av.	s/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	89.06%	2.17%	8.78%	100.00%
2	Harvill Av.	n/o Oleander Av.	93.82%	1.09%	5.09%	100.00%	88.99%	2.18%	8.83%	100.00%
3	Harvill Av.	s/o Oleander Av.	93.82%	1.09%	5.09%	100.00%	93.63%	1.13%	5.24%	100.00%
4	I-215 SB Fwy	n/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.82%	1.09%	5.09%	100.00%
2	I-215 SB Fwy	s/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.54%	1.15%	5.31%	100.00%
9	I-215 NB Fwy	n/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	92.75%	1.33%	5.92%	100.00%
7	I-215 NB Fwy	s/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.82%	1.09%	5.09%	100.00%
8	Harley Knox Bl.	e/o Harvill Av.	93.82%	1.09%	5.09%	100.00%	89.26%	2.12%	8.62%	100.00%
6	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	93.82%	1.09%	5.09%	100.00%	91.61%	1.59%	6.81%	100.00%
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	93.82%	1.09%	5.09%	100.00%	93.74%	1.11%	5.15%	100.00%
11	Oleander Av.	e/o Driveway 6	93.82%	1.09%	5.09%	100.00%	63.33%	8.04%	28.63%	100.00%
12	Oleander Av.	w/o Harvill Av.	93.82%	1.09%	5.09%	100.00%	68.00%	6.98%	25.03%	100.00%
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TABLE 6-5: YEAR 2017 CONDITIONS TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

¹ Source: Based on existing PM peak hour classification counts by vehicle type taken by Urban Crossroads, Inc. on 4/15/2015 at Harvill Avenue and Harley Knox Boulevard. ² Source: Knox Business Park Traffic Impact Analysis, Urban Crossroads, Inc., June 2015.



				No Pr	oject ¹			With Pi	roject²	
₽	Roadway	Segment	Autos	Medium Trucks	Heavy Trucks	Total	Autos	Medium Trucks	Heavy Trucks	Total
1	Harvill Av.	s/o Harley Knox Bl.	93.82%	1.09%	%60'5	100.00%	91.25%	1.67%	7.08%	100.00%
2	Harvill Av.	n/o Oleander Av.	93.82%	1.09%	2.09%	100.00%	91.25%	1.67%	7.08%	100.00%
3	Harvill Av.	s/o Oleander Av.	93.82%	1.09%	2.09%	100.00%	93.75%	1.10%	5.15%	100.00%
4	I-215 SB Fwy	n/o Harley Knox Bl.	93.82%	1.09%	5.09%	100.00%	93.82%	1.09%	5.09%	100.00%
5	I-215 SB Fwy	s/o Harley Knox Bl.	93.82%	1.09%	2.09%	100.00%	93.61%	1.13%	5.26%	100.00%
9	I-215 NB Fwy	n/o Harley Knox Bl.	93.82%	1.09%	2.09%	100.00%	93.12%	1.24%	5.63%	100.00%
7	I-215 NB Fwy	s/o Harley Knox Bl.	93.82%	1.09%	2.09%	100.00%	93.82%	1.09%	5.09%	100.00%
8	Harley Knox Bl.	e/o Harvill Av.	93.82%	1.09%	2.09%	100.00%	92.00%	1.50%	6.50%	100.00%
6	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	93.82%	1.09%	2.09%	100.00%	92.06%	1.49%	6.46%	100.00%
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	93.82%	1.09%	2.09%	100.00%	93.75%	1.10%	5.14%	100.00%
11	Oleander Av.	e/o Driveway 6	93.82%	1.09%	2.09%	100.00%	86.07%	2.85%	11.07%	100.00%
12	Oleander Av.	w/o Harvill Av.	93.82%	1.09%	5.09%	100.00%	86.07%	2.85%	11.07%	100.00%
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TABLE 6-6: YEAR 2035 CONDITIONS TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

¹ Source: Based on existing PM peak hour classification counts by vehicle type taken by Urban Crossroads, Inc. on 4/15/2015 at Harvill Avenue and Harley Knox Boulevard. ² Source: Knox Business Park Traffic Impact Analysis, Urban Crossroads, Inc., June 2015.

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6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-7. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

TABLE 6-7: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.



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7 OFF-SITE TRANSPORTATION NOISE IMPACTS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on the *Knox Business Park Traffic Impact Analysis*. (1) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway. Noise contours were developed for the following traffic scenarios:

- <u>Existing Without / With Project</u>: This scenario refers to the existing present-day noise conditions, without and with the proposed Preferred Project.
- <u>Year (2017) Without / With Project</u>: This scenario refers to the background noise conditions at future Year 2017 without and with the proposed Preferred Project.
- <u>Year (2035) Without / With Project</u>: This scenario refers to the background noise conditions at future Year 2035 without and with the proposed Project. This scenario corresponds to 2035 conditions, and includes all cumulative projects identified in the Traffic Impact Analysis.

7.1 TRAFFIC NOISE CONTOURS

To quantify the Project's traffic noise impacts on the surrounding areas, the changes in traffic noise levels on 12 roadway segments surrounding the Project were calculated based on the changes in the average daily traffic volumes. Based on the noise impact significance criteria described in Section 4 and shown on Table 4-2, a significant off-site traffic noise level impact occurs:

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
 - are less than 60 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project related noise level increase; or
 - range from 60 to 65 dBA and the Project creates a *barely perceptible* 3 dBA or greater Project noise level increase; or
 - already exceed 65 dBA, and the Project creates a community noise level impact of greater than 1.5 dBA (FICON, 1992).
- When the noise levels at existing and future non-noise-sensitive land uses (e.g. business park, industrial, etc.):
 - are less than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and the Project creates a *readily perceptible* 5 dBA or greater Project related noise level increase; or
 - are greater than the County of Riverside General Plan Noise Element, Table N-1, normally acceptable 70 dBA and the Project creates a barely perceptible 3 dBA or greater Project noise level increase.

Since the land uses adjacent to the study area roadways conveying Project traffic consist mostly of non-noise-sensitive business park/industrial uses, as shown on Table 7-1, the non-noise-sensitive significance criteria shall apply. Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are



measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may affect ambient noise levels. In addition, since the noise contours reflect modeling of vehicular noise along area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 through 7-6 present a summary of the unmitigated exterior traffic noise levels for the 12 study area roadway segments analyzed from the without Project to the with Project conditions in each of the three timeframes: Existing, Year 2017, and Year 2035 conditions. Appendix 7.1 includes a summary of the traffic noise level contours for each of the six traffic scenarios.

п	Road	Segment	Adjacent Planned	CNEL at Nearest Adjacent	Distar from C	nce to Co enterline	ontour e (Feet)
	Noud	Jeginent	Land Use ¹	Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	65.9	RW	115	247
2	Harvill Av.	n/o Oleander Av.	Business Park	65.6	RW	110	237
3	Harvill Av.	s/o Oleander Av.	Business Park	65.5	RW	107	231
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	74.3	194	418	901
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	73.8	180	388	836
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	73.6	173	373	803
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	72.9	156	336	724
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	65.1	RW	102	220
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	66.0	RW	117	253
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	67.1	RW	138	298
11	Oleander Av.	e/o Driveway 6	Business Park	44.1	RW	RW	RW
12	Oleander Av.	w/o Harvill Av.	Business Park	51.0	RW	RW	RW

TABLE 7-1: EXISTING WITHOUT PROJECT CONDITIONS NOISE CONTOURS

¹ Sources: County of Riverside General Plan, Mead Valley Area Plan Land Use Plan, Figure 3.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



п	Poad	Sogment	Adjacent	CNEL at Nearest Adjacent	Distar from C	nce to Co enterline	ntour e (Feet)
P	Noau	Jegment	Land Use ¹	Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	68.5	80	172	371
2	Harvill Av.	n/o Oleander Av.	Business Park	68.4	78	168	362
3	Harvill Av.	s/o Oleander Av.	Business Park	65.7	RW	111	240
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	74.3	194	418	901
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	74.0	185	400	861
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	74.2	191	412	888
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	72.9	156	336	724
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	67.8	RW	154	332
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	67.9	RW	157	338
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	67.2	RW	141	304
11	Oleander Av.	e/o Driveway 6	Business Park	63.8	RW	83	179
12	Oleander Av.	w/o Harvill Av.	Business Park	64.0	RW	86	184

TABLE 7-2: EXISTING WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



п	Road	Segment	Adjacent	CNEL at Nearest Adjacent	Distar from C	nce to Co enterline	ontour e (Feet)
	Noau	Jegment	Land Use ¹	Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	66.8	61	131	283
2	Harvill Av.	n/o Oleander Av.	Business Park	66.7	60	130	280
3	Harvill Av.	s/o Oleander Av.	Business Park	66.4	RW	124	267
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	75.5	234	503	1085
5	I-215 SB Fwy	s/o Harley Knox Bl. Light Industrial	75.2	223	479	1033	
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	75.0	214	461	993
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	73.9	181	391	842
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	66.1	RW	119	257
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	68.6	81	174	374
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	70.1	101	218	471
11	Oleander Av.	e/o Driveway 6	Business Park	44.1	RW	RW	RW
12	Oleander Av.	w/o Harvill Av.	Business Park	51.0	RW	RW	RW

TABLE 7-3: YEAR 2017 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



п	Road	Segment	Adjacent	CNEL at Nearest Adjacent	Distar from C	nce to Co enterline	ontour e (Feet)
	Noau	Jegment	Land Use ¹	Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	69.0	86	186	401
2	Harvill Av.	n/o Oleander Av.	Business Park	69.0	86	185	398
3	Harvill Av.	s/o Oleander Av.	Business Park	66.6	59	128	275
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	75.5	234	503	1085
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	75.4	227	490	1055
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	75.4	231	497	1070
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	73.9	181	391	842
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	68.4	78	168	363
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	69.7	96	207	447
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	70.2	102	221	476
11	Oleander Av.	e/o Driveway 6	Business Park	63.8	RW	83	179
12	Oleander Av.	w/o Harvill Av.	Business Park	64.0	RW	86	184

TABLE 7-4: YEAR 2017 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



п	Road Segment	Segment	Adjacent Planned	CNEL at Nearest Adjacent	Distar from C	nce to Co enterline	ontour e (Feet)
	Noau	Jegment	Land Use ¹	Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	69.7	96	207	447
2	Harvill Av.	n/o Oleander Av.	Business Park	69.7	96	207	447
3	Harvill Av.	s/o Oleander Av.	Business Park	70.6	109	236	508
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	76.8	285	613	1321
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	76.4	267	576	1241
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	76.9	287	618	1332
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	75.7	239	516	1111
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	70.5	108	232	500
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	69.6	95	204	440
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	70.8	113	243	524
11	Oleander Av.	e/o Driveway 6	Business Park	62.3	RW	66	141
12	Oleander Av.	w/o Harvill Av.	Business Park	62.3	RW	66	141

TABLE 7-5: YEAR 2035 WITHOUT PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.



п	Road	Sormont	Adjacent	CNEL at Nearest Adjacent	Distar from C	nce to Co enterline	ontour e (Feet)
ם	Noau	Jegment	Land Use ¹	Land Use (dBA) ²	70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	71.0	117	253	544
2	Harvill Av.	n/o Oleander Av.	Business Park	71.0	117	253	544
3	Harvill Av.	s/o Oleander Av.	Business Park	70.7	111	238	514
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	76.8	285	613	1321
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	76.5	272	585	1261
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	77.2	301	649	1399
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	75.7	239	516	1111
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	71.5	125	269	580
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	70.6	109	235	507
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	70.8	114	245	528
11	Oleander Av.	e/o Driveway 6	Business Park	66.1	55	118	254
12	Oleander Av.	w/o Harvill Av.	Business Park	66.1	55	118	254

TABLE 7-6: YEAR 2035 WITH PROJECT CONDITIONS NOISE CONTOURS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING CONDITION PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-1 presents the Existing without Project conditions CNEL noise levels. From this we can see that the exterior noise levels are expected to range from 44.1 to 74.3 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions will range from 63.8 to 74.3 dBA CNEL. As shown on Table 7-7 the Project will generate *potentially significant* noise level increases of 13.0 to 19.7 dBA CNEL on two study area roadway segments: Oleander Avenue east of Driveway 6, and west of Harvill Avenue. However, it is important to note that Oleander Avenue is not fully constructed west of the future location of Driveway 6, which prevents existing through traffic along Oleander Avenue. The Existing without Project noise levels ranged from 44.1 to 51.0 dBA CNEL due to the low existing traffic volumes along these segments. Further, the Project-generated traffic represents a larger noise level increase since the roadway will be fully constructed under Existing with Project conditions. Moreover, the Project-related traffic noise level increases will not cause the Existing without Project noise levels to exceed the County of Riverside General Plan Noise Element *normally acceptable* 70 dBA CNEL *Land Use Compatibility for Community Noise Exposure* criteria for Business Park and Industrial land uses.

However, based on the significance criteria in Section 4, the *readily perceptible* Project-related increases of greater than 5 dBA at non-noise-sensitive land uses represent a *potentially significant* impact under Existing conditions.



ID	Road	Segment	Adjacent Planned	CN Lai	EL at Adja nd Use (d	icent BA) ²	Pote Significar at Rece	ntial nt Impact eivers? ³
			Land Use ¹	No Project	With Project	Project Addition	Noise- Sensitive	Non Noise- Sensitive
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	65.9	68.5	2.6	No	No
2	Harvill Av.	n/o Oleander Av.	Business Park	65.6	68.4	2.8	No	No
3	Harvill Av.	s/o Oleander Av.	Business Park	65.5	65.7	0.2	No	No
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	74.3	74.3	0.0	No	No
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	73.8	74.0	0.2	No	No
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	73.6	74.2	0.6	No	No
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	72.9	72.9	0.0	No	No
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	65.1	67.8	2.7	No	No
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	66.0	67.9	1.9	No	No
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	67.1	67.2	0.1	No	No
11	Oleander Av.	e/o Driveway 6	Business Park	44.1	63.8	19.7	No	Yes
12	Oleander Av.	w/o Harvill Av.	Business Park	51.0	64.0	13.0	No	Yes

TABLE 7-7: EXISTING CONDITION OFF-SITE PROJECT RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Significance Criteria (Section 4).

7.3 YEAR 2017 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-8 presents a comparison of the Year 2017 without and with Project conditions CNEL noise levels. Table 7-3 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 44.1 to 75.5 dBA CNEL without the Project. Table 7-4 presents the Year 2017 with Project conditions noise level contours that are expected to range from 63.8 to 75.5 dBA CNEL. As shown on Table 7-8 the Project will generate potentially significant noise level increases of 13.0 to 19.7 dBA CNEL on two study area roadway segments: Oleander Avenue east of Driveway 6, and west of Harvill Avenue. However, it is important to note that Oleander Avenue is not fully constructed west of the future location of Driveway 6, which prevents through traffic along Oleander Avenue. The Year 2017 without Project noise levels range from 44.1 to 51.0 dBA CNEL due to the low traffic volumes along these segments. Further, the Project-generated traffic then represents a larger noise level increase since the roadway will be fully constructed under Year 2017 with Project conditions. Moreover, the Project-related traffic noise level increases will not cause the Year 2017 without Project noise levels to exceed the County of Riverside General Plan Noise Element normally acceptable 70 dBA CNEL Land Use Compatibility for Community Noise Exposure criteria for Business Park and Industrial land uses.



However, based on the significance criteria in Section 4, the *readily perceptible* Project-related increases of greater than 5 dBA at non-noise-sensitive land uses represents a *potentially significant* impact under Year 2017 conditions.

ID	Road	Segment	Adjacent Planned	CN Lai	EL at Adja nd Use (d	acent BA) ²	Pote Significa at Rece	ntial nt Impact eivers? ³
			Land Use ¹	No Project	With Project	Project Addition	Noise- Sensitive	Non Noise- Sensitive
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	66.8	69.0	2.2	No	No
2	Harvill Av.	n/o Oleander Av.	Business Park	66.7	69.0	2.3	No	No
3	Harvill Av.	s/o Oleander Av.	Business Park	66.4	66.6	0.2	No	No
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	75.5	75.5	0.0	No	No
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	75.2	75.4	0.2	No	No
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	75.0	75.4	0.4	No	No
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	73.9	73.9	0.0	No	No
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	66.1	68.4	2.3	No	No
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	68.6	69.7	1.1	No	No
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	70.1	70.2	0.1	No	No
11	Oleander Av.	e/o Driveway 6	Business Park	44.1	63.8	19.7	No	Yes
12	Oleander Av.	w/o Harvill Av.	Business Park	51.0	64.0	13.0	No	Yes

TABLE 7-8: YEAR 2017 OFF-SITE PROJECT RELATED TRAFFIC NOISE IMPACTS

¹ Sources: County of Riverside General Plan, Mead Valley Area Plan Land Use Plan, Figure 3.

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Significance Criteria (Section 4).

7.4 YEAR 2035 PROJECT TRAFFIC NOISE LEVEL CONTRIBUTIONS

Table 7-9 presents a comparison of the Year 2035 without and with Project conditions CNEL noise levels. Table 7-5 shows that the exterior noise levels without accounting for any noise attenuation features are expected to range from 62.3 to 76.9 dBA CNEL without the Project. Table 7-6 presents the Year 2035 with Project conditions noise level contours that are expected to range from 66.1 to 77.2 dBA CNEL. As shown on Table 7-9 the Project will not generate any potentially significant noise level increases on the study area roadway segments. Based on the significance criteria in Section 4, the Project-related traffic noise level increases will be *less than significant* impacts under Year 2035 conditions.



ID	Road	Segment	Adjacent Planned	CNI Lai	EL at Adja nd Use (d	icent BA) ²	Pote Significar at Rece	ntial nt Impact eivers? ³
			Land Use ¹	No Project	With Project	Project Addition	Noise- Sensitive	Non Noise- Sensitive
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	69.7	71.0	1.3	No	No
2	Harvill Av.	n/o Oleander Av.	Business Park	69.7	71.0	1.3	No	No
3	Harvill Av.	s/o Oleander Av.	Business Park	70.6	70.7	0.1	No	No
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	76.8	76.8	0.0	No	No
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	76.4	76.5	0.1	No	No
6	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	76.9	77.2	0.3	No	No
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	75.7	75.7	0.0	No	No
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	70.5	71.5	1.0	No	No
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	69.6	70.6	1.0	No	No
10	Harley Knox Bl.	e/o I-215 NB Fwy Ramps	Light Industrial	70.8	70.8	0.0	No	No
11	Oleander Av.	e/o Driveway 6	Business Park	62.3	66.1	3.8	No	No
12	Oleander Av.	w/o Harvill Av.	Business Park	62.3	66.1	3.8	No	No

TABLE 7-9: YEAR 2035 OFF-SITE PROJECT RELATED TRAFFIC NOISE IMPACTS

² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Significance Criteria (Section 4).

7.5 CUMULATIVE PROJECT TRAFFIC NOISE IMPACTS

According to the U.S. Environmental Protection Agency (EPA), cumulative impacts represent the combined incremental effects of human activities that accumulate over time. (19) While the incremental impacts may be insignificant by themselves, the combined effect may result in a significant impact. The level of significance attributed to a cumulative noise impact is based on a comparison of the Existing without Project noise levels with the future Year 2035 without Project noise levels. A significant impact occurs when the Existing noise levels at nearby Business Park/Industrial land uses are less than the County of Riverside General Plan Noise Element, Table N-1, *normally acceptable* 70 dBA and a *readily perceptible* 5 dBA or greater noise level increase occurs; or are greater than the *normally acceptable* 70 dBA and a *barely perceptible* 3 dBA or greater noise level increase occurs due to cumulative development.

Table 7-10 shows that the cumulative increase from Existing to Year 2035 without Project conditions will range from 2.5 to 18.2 dBA CNEL. Based on the significance criteria in Section 4, the cumulative increase represents a *significant* cumulative impact on the non-noise-sensitive land uses adjacent to the study area roadway segments. To determine if the Project-related contribution to the cumulative noise impact is potentially significant, the Year 2035 Project-related noise level increases were combined with the cumulative Year 2035 without Project noise level increases. As previously shown on Table 7-9, the Year 2035 with Project noise level increases will approach 3.8 dBA CNEL and represent a *less than significant* impact under Year 2035 conditions. However, to determine if the Project-related impact is cumulatively



considerable, the Project's contribution to the cumulative impact must be determined. As shown on Table 7-10, the combined Project plus cumulative noise level increases will range from 4.4 to 18.4 dBA CNEL. The Project contribution to the cumulative increase is then determined by subtracting the Year 2035 cumulative traffic noise level increase from the combined Project plus cumulative noise level increase. The Project's actual contribution to the cumulative noise level increases will range from 0.2 to 1.9 dBA CNEL, and will not exceed the significance thresholds for non-noise-sensitive land uses. Therefore, since the Project-related off-site traffic noise level increases represent a *less than significant* contribution to the cumulative noise impacts, the Project-related traffic noise level increases are *less than cumulatively considerable*.



			Adiacant	CNEL at Land	Adjacent Use ²	Cumu	lative	Noise Level	l Increases	Project	Related
9	Road	Segment	Planned Land Use ¹	Existing Without Project (Table 7-1)	Year 2035 Without Project (Table 7-5)	Increase From Existing ³	Potential Impact? ⁴	Year 2035 Project- Related (Table 7-9)	Project Plus Cumulative ⁵	Cumulative Contribution ⁶	Cumulatively Considerable Impact? ⁷
1	Harvill Av.	s/o Harley Knox Bl.	Business Park	62.9	69.7	3.8	No	1.3	5.7	1.9	No
2	Harvill Av.	n/o Oleander Av.	Business Park	65.6	69.7	4.1	No	1.3	5.9	1.8	No
З	Harvill Av.	s/o Oleander Av.	Business Park	65.5	20.6	5.1	Yes	0.1	6.3	1.2	No
4	I-215 SB Fwy	n/o Harley Knox Bl.	Light Industrial	74.3	76.8	2.5	No	0.0	4.4	1.9	No
5	I-215 SB Fwy	s/o Harley Knox Bl.	Light Industrial	73.8	76.4	2.6	No	0.1	4.5	1.9	No
9	I-215 NB Fwy	n/o Harley Knox Bl.	Light Industrial	73.6	76.9	3.3	Yes	0.3	5.1	1.8	No
7	I-215 NB Fwy	s/o Harley Knox Bl.	Light Industrial	72.9	75.7	2.8	No	0.0	4.6	1.8	No
8	Harley Knox Bl.	e/o Harvill Av.	Business Park	65.1	70.5	5.4	Yes	1.0	6.7	1.3	No
9	Harley Knox Bl.	e/o I-215 SB Fwy Ramps	Light Industrial	66.0	69.69	3.6	No	1.0	5.5	1.9	No
10	Harley Knox Bl.	e/o l-215 NB Fwy Ramps	Light Industrial	67.1	70.8	3.7	No	0.0	5.2	1.5	No
11	Oleander Av.	e/o Driveway 6	Business Park	44.1	62.3	18.2	Yes	3.8	18.4	0.2	No
12	Oleander Av.	w/o Harvill Av.	Business Park	51.0	62.3	11.3	Yes	3.8	12.0	0.7	No
.											

TABLE 7-10: YEAR 2035 OFF-SITE CUMULATIVE TRAFFIC NOISE IMPACTS (DBA CNEL)

¹ Sources: County of Riverside General Plan, Mead Valley Area Plan Land Use Plan, Figure 3. ² The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the nearest adjacent land use.

³ Increase from Existing without Project to Year 2035 without Project conditions.

⁴ Does the cumulative increase without the Project exceed the 3 dBA significance criteria for non-noise-sensitive land uses?

⁵ Combined cumulative and Project Year 2035 noise level increases.

⁶ Total Project contribution to the cumulative noise level increase. ⁷ Does the Project-related contribution to the cumulative noise level increase exceed the 3 dBA significance criteria for non-noise-sensitive land uses?





8 **RECEIVER LOCATIONS**

To assess the potential for long-term operational and short-term construction noise impacts, the following eight receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, outpatient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Representative sensitive receivers near the Project site include the single-family residential homes at locations R1 to R8. The closest noise-sensitive receiver is represented by location R6 where an existing residential home is located approximately 191 feet from the Project site boundary.

- R1: Located approximately 1,992 feet northwest of the Project site along Corson Avenue, R1 represents existing single-family residential homes. A long-term noise measurement was taken near this location, L1, to describe the existing ambient noise environment.
- R2: Location R2 represents the existing residential homes located roughly 1,141 feet west of the Project site and east of Day Street. A long-term noise measurement was taken near this location, L2, to describe the existing ambient noise environment.
- R3: Location R3 represents the existing residential homes situated southwest of the Project site at approximately 1,044 feet along Nance Street. A long-term noise measurement was taken at this location, L3, to describe the existing ambient noise environment.
- R4: Location R4 represents the existing residential homes situated approximately 631 feet southwest of the Project site.
- R5: At approximately 780 feet, location R5 represents a single-family residential home situated along Decker Road south of the Project site. A long-term noise measurement was taken near this location, L6, to describe the existing ambient noise environment.
- R6: At 191 feet south of the Project site, R6 describes the residential homes located along Redwood Drive. A long-term noise measurement was taken near this location, L4, to describe the existing ambient noise environment.
- R7: Location R7 represents the existing residential home located approximately 814 feet southeast of the Project site along Donna Lane.
- R8: At approximately 1,163 feet, location R8 represents a single-family residential home situated along Harvill Avenue, east of the Project site. A long-term noise measurement was taken near this location, L5, to describe the existing ambient noise environment.





EXHIBIT 8-A: RECEIVER LOCATIONS

Receiver Locations

Distance from receiver to Project site boundary (in feet)



9 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at nearby receiver locations resulting from operation of the proposed Knox Business Park. Exhibit 9-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE STANDARDS

The County of Riverside has set exterior noise limits to control idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods associated with projects like the proposed Knox Business Park. The County considers noise generated by the use of motor vehicles to be a stationary noise source when operated on private property such as at a truck terminal or warehousing facility. These facility-related noises, as projected to any portion of any surrounding property containing a *habitable dwelling, hospital, school, library or nursing home*, must not exceed the following worst-case noise levels.

Policy N 4.1 of the Noise Element sets an exterior noise limit not to be exceeded for a cumulative period of more than ten minutes in any hour of 65 dBA Leq for daytime hours of 7:00 a.m. to 10:00 p.m., and 45 dBA Leq during the noise-sensitive nighttime hours of 10:00 p.m. to 7:00 a.m. Policy N 4.8 of the Noise Element requires that loading docks of industrial land uses minimize the potential noise impacts of vehicles on the site, as well on the adjacent land uses. (12) The County of Riverside operational noise standards used in this analysis are shown on Table 3-1.

9.2 OPERATIONAL NOISE SOURCES

At the time this noise analysis was prepared, the future tenants of the proposed Project were unknown. Furthermore, this analysis assumes the Project would be operational 24 hours per day, seven days per week. This analysis does not account for the noise associated with tenants that require cold storage (refrigeration). Business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, and the loading and unloading of trucks at designated loading bays. The on-site Project related noise sources are expected to include: idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods.

This analysis does not account for any special noise generators that may be needed to accommodate the needs of specific Knox Business Park building tenants. Special noise generators may consist of outdoor compressors, air scrubbers, heavy materials handlings, HVAC units, emergency generators, etc. This noise analysis is intended to describe noise level impacts associated with the expected typical warehouse and distribution storage activities at the Project site.



9.3 REFERENCE NOISE LEVELS

Since the future tenants of the proposed Project are unknown, the Project's operational noise levels were estimated based on reference noise level measurements of similar logistics warehouse buildings. The reference noise levels are intended to describe the expected operational noise sources that may include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods. To estimate the Project off-site operational noise impacts associated with the Knox Business Park, the following reference noise level measurements were collected at an existing logistics warehouse containing similar operational noise sources, as shown on Table 9-1. Appendix 9.1 includes reference noise source photos for each location.

9.3.1 MOTIVATIONAL FULFILLMENT & LOGISTICS SERVICES DISTRIBUTION FACILITY (DRY GOODS)

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building with a loading dock area along the western side of the building façade. Two reference noise level measurements were taken at this location, including entry gate activity and unloading/docking activity noise sources. Up to ten trucks were observed in the loading dock area including a combination of track trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

ENTRY GATE ACTIVITY

The entry gate activity noise level measurement was taken at the southern entry gate over a 15minute period and represents multiple noise sources producing a reference noise level of 64.0 dBA Leq. The noise sources included at this measurement location account for the rattling and squeaking during normal opening and closing operations, the gate closure equipment, truck engines idling outside the entry gate, and background forklift backup alarm noise.

UNLOADING/DOCKING ACTIVITY

The unloading/docking activity noise level measurement was taken over a 15-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 67.2 dBA Leq. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.



9.3.2 WORST-CASE REFERENCE NOISE LEVELS

To describe the worst-case Project-only operational noise levels associated with the Knox Business Park, this analysis relies on a reference noise level of 67.2 dBA Leq representing unloading/docking activity taken at the Motivational Fulfillment & Logistics Services Distribution Facility (dry storage).

As shown on Table 9-1, the reference noise level of 67.2 dBA was measured at a distance of 30 feet and at a height of 8 feet. While the specific noise levels at the Project site will depend on the actual tenant, the intensity and the daytime / nighttime hours of operation, a reference noise level of 67.2 dBA Leq is used to describe the peak Project operational noise activity since it represents similar operational characteristics. The reference noise levels are intended to describe noise level impacts associated with the expected typical warehouse and distribution storage operations at the Project site and do not account for any special noise generators.

Noise Source	Duration (hh:mm:ss)	Distance From Source (Feet)	Noise Source Height (Feet)	Hourly Activity (Minutes) ²	Hourly (dBA Leq)
Entry Gate Activity ¹	0:15:00	20'	8'	60	64.0
Unloading/Docking Activity ¹	0:15:00	30'	8'	60	67.2

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

¹Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The reference noise level measurements were collected on Wednesday, January 7, 2015.

² Duration (minutes within the hour) of noise activity during peak hourly conditions.





EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

09349-30 Noise Study

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9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the 67.2 dBA Leq reference noise level to represent the proposed logistics warehouse operations that include idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods, it is possible to estimate the operational source noise levels generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations shown on Table 9-2 account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source (idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods). In addition, the operational noise analysis accounts for the additional noise attenuation associated with the topographic relationship between the noise source, barrier and receiver locations based on the Project grading plans prepared by HPA Architecture. The elevations used for this analysis are included in the operational noise level calculation sheets in Appendix 9.2.

Table 9-2 presents the exterior noise levels including the barrier attenuation provided by the recommended 8-foot high noise barriers along the southern Project site boundary, as shown on Exhibit 9-A. Both the 8-foot high noise barriers were located at the top of slope elevation along the property line of the Project site to provide greater noise attenuation to nearby sensitive receivers. Table 9-2 indicates that the hourly noise levels associated with the Knox Business Park are expected to range from 28.4 to 37.8 dBA Leq at the sensitive receiver locations. The operational noise level calculations are included in Appendix 9.2.

9.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

The operational noise levels associated with the idling trucks, delivery truck activities, parking, backup alarms, as well as loading and unloading of dry goods at the Knox Business Park will not exceed the County of Riverside General Plan Noise Element daytime (7:00 a.m. to 10:00 p.m.) noise level standard of 65 dBA Leq or the nighttime (10:00 p.m. to 7:00 a.m.) noise level standard of 45 dBA Leq at the sensitive residential receiver locations, as shown on Table 9-3. The Project-only noise levels shown on Table 9-3 include the attenuation provided by the recommended 8-foot high noise barriers along the southern Project site boundary. Without the recommended noise barriers at receiver location R6, which represents the closest residential homes along Redwood Drive to the Project site, the Project-only operational noise levels would not satisfy the County of Riverside General Plan Noise Element standards.



		Distance	Attenuatio	n (dBA Leq)	Noise Level	
Receiver Location ¹	Project Noise (dBA Leq) ²	From Source To Receiver (Feet) ³	Distance ⁴	Recommended Noise Barriers⁵	At Receiver Locations (dBA Leq) ⁶	
R1	67.2	2,598'	-38.8	0.0	28.4	
R2	67.2	1,685'	-35.0	0.0	32.2	
R3	67.2	1,577'	-34.4	0.0	32.8	
R4	67.2	1,164'	-31.8	0.0	35.4	
R5	67.2	881'	-29.4	0.0	37.8	
R6	67.2	276'	-19.3	-11.0	36.9	
R7	67.2	998'	-30.4	0.0	36.8	
R8	67.2	1,310'	-32.8	0.0	34.4	

TABLE 9-2: OPERATIONAL NOISE LEVEL PROJECTIONS (DBA LEQ)

¹ See Exhibit 9-A for the noise receiver and noise source locations.

² Worst-case Project-only reference noise level from Table 9-1.

³ Estimated distances to nearest loading dock activities.

⁴ Noise levels diminish at a rate 6 dBA per doubling of distance and a reference distance of 30 feet.

⁵ Calculated noise attenuation provided by the recommended barriers, as shown on Exhibit 9-A.

⁶ Estimated Project stationary source noise levels.

Receiver Location ¹	Noise Level At Receiver Locations	Noise Stan (dBA	Level dard Leq) ³	Comp	Compliance ⁴		
	(dBA Leq) ²	Daytime	Nighttime	Daytime	Nighttime		
R1	28.4	65	45	Yes	Yes		
R2	32.2	65	45	Yes	Yes		
R3	32.8	65	45	Yes	Yes		
R4	35.4	65	45	Yes	Yes		
R5	37.8	65	45	Yes	Yes		
R6	36.9	65	45	Yes	Yes		
R7	36.8	65	45	Yes	Yes		
R8	34.4	65	45	Yes	Yes		

¹ See Exhibit 9-A for the noise receiver and noise source locations.

² Estimated Project stationary source noise levels as shown on Table 9-2.

³ Noise standards as shown on Table 3-1.

⁴ Do the estimated Project stationary source noise levels meet the noise standards on the affected land uses?

"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.



9.6 CUMULATIVE OPERATIONAL NOISE IMPACTS

To account for potential cumulative stationary-source noise impacts, cumulative developments in the Project study area were identified. The cumulative developments used in this analysis were obtained from the *Knox Business Park Traffic Impact Analysis*, and are described on Table 9-4. The cumulative development locations, shown on Exhibit 9-B, represent those off-site cumulative development projects with potential to generate off-site operational noise sources and do not account for any planned residential land uses. In addition, planned development projects east of the I-215 Freeway were not included in the cumulative noise analysis due to their increased distance to the sensitive receiver locations. Further, the traffic noise levels from the I-215 Freeway are expected to largely overshadow and effectively mask potential stationary-source noise levels at planned developments east of the freeway, and, therefore, they do not represent considerable contributions to the existing noise environment at each of the receiver locations.

9.6.1 CUMULATIVE DEVELOPMENT OPERATIONAL NOISE LEVELS

Exhibit 9-B shows the location of each cumulative development in relation to the Project site and the noise-sensitive receiver locations. By identifying each development near the Project, the potential effects at each receiver location, such as a potential land use change or future development which would block the noise contributions from the Project site to the receiver, can be determined. Further, each development's potential stationary noise sources were estimated based on their planned land use designation. The stationary-source noise levels are determined using reference noise level measurements of similar land uses taken by Urban Crossroads, Inc. The cumulative developments and potential stationary noise sources are shown on Table 9-4.

Table 9-5 shows the estimated cumulative development noise levels at each receiver location from the operation of the projects identified on Table 9-4, based on the distance to each sensitive receiver location. The analysis shows that the noise levels due to the cumulative development activities are expected to range from 35.0 to 60.2 dBA Leq. The stationary-source cumulative noise level calculations are provided in Appendix 9.3.





EXHIBIT 9-B: CUMULATIVE DEVELOPMENT LOCATION MAP



Cumulative Development Number ¹	Development Name	Land Use(s)	Estimated Stationary Noise Source(s) ²
P-13	P 06-0411 (Concrete Batch Plant)	Manufacturing	Unloading/Docking Activity ³
P-20	Starcrest, P011-0005; 08-11-0006	General Light Industrial	Unloading/Docking Activity ³
P-47	PM 34199, DPR 05-0387, DPR 05-0452, TPM 34697, DPR 06-0396	General Light Industrial Warehousing	Unloading/Docking Activity ³
RC-1	Majestic Freeway Business Center	High-Cube Warehouse	Unloading/Docking Activity ³
RC-2	PP 20699 (Oleander Business Park)	Warehousing	Unloading/Docking Activity ³
RC-6	Meridian Business Park North	Industrial Park	Unloading/Docking Activity ³
RC-10	PP 21144	Industrial Park	Unloading/Docking Activity ³
RC-12	CUP03315	Gas Station with Market Fast Food without Drive Thru High-Turnover Restaurant	Parking Lot Vehicle Movements ⁴
RC-13	PP23342	Industrial Park	Unloading/Docking Activity ³
RC-15	Rider Street Quarry	Quarry	Unloading/Docking Activity ³
RC-22	Blanding Assemblage	High-Cube Warehouse	Unloading/Docking Activity ³

TABLE 9-4: CUMULATIVE DEVELOPMENTS AND STATIONARY NOISE SOURCES

¹ Source: Knox Business Park Traffic Impact Analysis, Urban Crossroads, Inc. See Exhibit 9-B for the development locations.

² Estimated based on the land use(s) of each development using reference noise level measurements taken by Urban Crossroads, Inc. ³ Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The reference noise level measurements were collected on Wednesday, January 7, 2015.

⁴ As measured by Urban Crossroads, Inc. on 5/30/2012 at the Laguna Niguel Walmart located at 27470 Alicia Parkway.



Cumulative		Noise	Levels a	t Receive	er Locatio	ons (dBA	Leq)1	
Number	R1	R2	R3	R4	R5	R6	R7	R8
P-13	19.1	19.8	19.6	20.1	21.2	22.1	23.8	27.9
P-20	16.8	16.8	17.2	17.6	19.1	19.2	21.2	20.4
P-47	19.3	20.2	20.2	20.8	22.3	23.3	25.8	30.1
RC-1	52.2	_2	54.3	56.5	49.8	_2	60.2	_2
RC-2	27.8	30.3	29.5	30.9	30.8	33.9	30.9	50.0
RC-6	17.1	16.1	15.5	15.4	14.8	15.2	14.7	15.8
RC-10	14.7	15.6	16.1	16.3	17.5	17.3	18.5	17.2
RC-12	11.2	12.2	12.7	13.0	14.5	14.3	16.1	14.5
RC-13	14.1	15.0	15.4	15.6	16.8	16.6	17.8	16.8
RC-15	17.0	18.0	18.8	18.8	19.6	18.9	19.3	17.3
RC-22	31.8	32.1	29.7	30.5	28.5	30.2	26.4	27.8
Combined Noise Levels	52.3	35.0	54.3	56.5	49.9	36.2	60.2	50.1

TABLE 9-5: CUMULATIVE DEVELOPMENT OPERATIONAL NOISE LEVEL PROJECTIONS (DBA LEQ)

¹ See Exhibit 9-B for the noise receiver and cumulative development locations and Appendix 9.3 for the stationary source noise analysis worksheets.

² The noise receiver is located within the cumulative development boundaries.

9.6.2 OPERATIONAL NOISE LEVEL CONTRIBUTIONS

The ambient noise level measurements, previously shown on Table 5-1, were used in this analysis to determine the existing ambient noise environment at each receiver location. Once the noise level contributions created by the cumulative developments and Project are determined, the Project's overall contribution to the cumulative noise level increases can then be evaluated.

To assess the noise level contributions from cumulative development in the Project study area, the cumulative development activity noise levels, shown on Table 9-5, were combined with the existing noise levels at each receiver location. The existing noise levels were then subtracted from the combined cumulative plus existing noise levels to determine the magnitude of the noise level increases due to the cumulative developments. Table 9-6 shows the cumulative daytime noise level increases on existing conditions will approach 3.2 dBA Leq at the receiver locations. Based on the significance criteria in Section 4, the cumulative development impacts during the daytime hours represent a *less than significant* impact on the existing ambient noise environment.


Table 9-7 shows the cumulative development nighttime noise level increases will range from 0.1 to 13.8 dBA Leq. Based on the significance criteria in Section 4, the cumulative noise level increases represent a *significant* cumulative noise level contribution at receiver locations R1, and R3 to R5 during the nighttime hours.

The Project-only noise level projections, previously shown on Table 9-2, are then combined with the existing ambient noise level measurements at each receiver location to identify the combined Project plus existing ambient noise levels. The combined noise levels can then be used to calculate the Project contribution to the ambient noise conditions. Tables 9-6 and 9-7 show the Project daytime and nighttime noise level contributions, respectively. The Project-related operational noise level increases at the noise-sensitive receivers will approach 0.1 dBA Leq during the daytime hours, and 0.8 dBA Leq during the nighttime hours. Based on the significance criteria in Section 4, the Project-related operational noise level increases are *less than significant* at the noise-sensitive receiver locations during the daytime and nighttime hours.

Since the combined cumulative plus existing noise levels generate a *significant* noise level contribution on the existing ambient conditions during the nighttime hours, it is necessary to determine if the nighttime Project-related noise contribution on the *significant* cumulative noise level increase is cumulatively considerable. By combining the cumulative development activity, Project-only, and existing ambient noise levels, the cumulative plus Project plus existing noise level contribution on the existing ambient conditions can be determined. The noise level increases due to the combined cumulative plus Project noise levels will range from 0.1 to 13.8 dBA Leq at the receiver locations. To determine the Project's contributions to the cumulative noise level increases, the cumulative plus existing increases ranging from 0.1 to 13.8 dBA Leq are subtracted from the combined cumulative plus Project-related noise level contributions. The results of this analysis indicate that the Project's noise level increase during the nighttime hours. When compared with the significance criteria described in Section 4, the Project-related noise level contribution to the cumulative noise level environment will be *less than significant*, and therefore, is *less than cumulatively considerable*.

It is important to note that the cumulative development analysis represents the worst-case cumulative noise conditions with all potential stationary noise sources operating simultaneously, 24-hours and seven days per week. Further, this analysis assumes the noise source within each development is operating at the site boundary, which may not represent actual conditions once each development is fully constructed. The cumulative development noise analysis does not account for future noise barriers or topographic changes within each development which may provide further attenuation to the noise levels estimated at the receiver locations in the Project study area.



Potentially	Significant Impact? ⁵	oN	No	No	No	٥N	٥N	٥N	No	
oject Plus A Leq) ⁸	Project Contribution	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	
ive Plus Pro Existing Levels (dB/	Increase Over Existing	1.4	0.0	2.2	3.2	1.0	0.1	0.5	0.2	
Cumulati Noise	Logarithmic Sum	57.8	58.2	58.3	59.3	56.9	56.0	70.0	63.2	
Potentially	Significant Impact? ⁵	No								
Existing :t Noise A Leq) ⁷	Increase Over Existing	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	
Combined Plus Projec Levels (dB,	Logarithmic Sum	56.4	58.2	56.1	56.1	56.0	56.0	69.5	63.0	
Project Only Onerational	Noise Level ⁶	28.4	32.2	32.8	35.4	37.8	36.9	36.8	34.4	
Potentially	Significant Impact? ⁵	No								
ve Plus se Levels eq) ⁴	Increase Over Existing	1.4	0.0	2.2	3.2	1.0	0.0	0.5	0.2	
Cumulativ Existing Noi (dBA Lu	Logarithmic Sum	57.8	58.2	58.3	59.3	6:95	6:55	0.07	63.2	
Cumulative Dev. Only	Noise Level ³	52.3	35.0	54.3	56.5	49.9	36.2	60.2	50.1	iver locations.
ing ent :ments eq) ²	Noise Level	56.4	58.2	56.1	56.1	55.9	55.9	69.5	63.0	noise rece
Exist Ambi Measure (dBA L	Meas. Location	L1	٢٦	L3	L3	L4	L4	٢٦	L5	9-B for the
Receiver	Location ¹	R1	R2	R3	R4	R5	R6	R7	R8	¹ See Exhibit

TABLE 9-6: CUMULATIVE DAYTIME NOISE LEVEL CONTRIBUTIONS (DBA LEQ)

² Existing noise level measurement locations are shown on Exhibit 5-A, and the noise levels are shown on Table 5-1.

³ Cumulative development operational noise levels at each receiver location as shown on Table 9-5.

⁴ Represents the combined exiting ambient conditions plus the cumulative development activities. ⁵ Does the noise level increase exceed the significance criteria described in Section 4 (Table 4-2)?

⁶ Total Project operational noise levels as shown on Table 9-2.

⁷ Represents the combined existing ambient conditions plus the Project activities, and the noise level increase expected with the addition of the proposed Project activities. ⁸ Represents the combined ambient conditions plus the Project activities plus the cumulative development activities.



Potentially	Significant Impact? ⁵	οN	٥N	οN	οN	οN	οN	οN	٥N	
ject Plus Leq) ⁸	Project Contribution	0.0	0.0	0.0	0.0	0.2	0.6	0.0	0.0	
ive Plus Pro Existing Levels (dB/	Increase Over Existing	7.9	0.1	11.8	13.8	6.6	1.2	1.0	0.6	
Cumulati Noise	Logarithmic Sum	53.1	51.8	54.7	26.7	51.2	45.8	67.3	58.8	
Potentially	Significant Impact? ⁵	No								
Existing :t Noise A Leq) ⁷	Increase Over Existing	0.1	0.0	0.4	0.7	0.8	0.7	0.0	0.0	
Combined Plus Projec Levels (dB	Logarithmic Sum	45.3	51.7	43.3	43.6	45.4	45.3	66.3	58.2	
Project Only Onerational	Noise Level ⁶	28.4	32.2	32.8	35.4	37.8	36.9	36.8	34.4	
Potentially	Significant Impact? ⁵	Yes	No	Yes	Yes	Yes	No	No	No	
ve Plus se Levels eq) ⁴	Increase Over Existing	7.8	0.1	11.7	13.8	6.4	9.0	1.0	0.6	
Cumulati Existing Noi (dBA L	Logarithmic Sum	53.0	51.8	54.6	56.7	51.0	45.2	67.3	58.8	
Cumulative Dev. Only	Noise Level ³	52.3	35.0	54.3	56.5	49.9	36.2	60.2	50.1	
ng ent ments eq) ²	Noise Level	45.2	51.7	42.9	42.9	44.6	44.6	66.3	58.2	
EXIST Ambi Measure (dBA L	Meas. Location	L1	٢٦	L3	L3	L4	L4	٢٦	L5	
Receiver	Location ¹	R1	R2	R3	R4	R5	R6	R7	R8	

TABLE 9-7: CUMULATIVE NIGHTTIME NOISE LEVEL CONTRIBUTIONS (DBA LEQ)

¹ See Exhibit 9-B for the noise receiver locations.

² Existing noise level measurement locations are shown on Exhibit 5-A, and the noise levels are shown on Table 5-1.

³ Cumulative development operational noise levels at each receiver location as shown on Table 9-5.

⁴ Represents the combined exiting ambient conditions plus the cumulative development activities.

⁵ Does the noise level increase exceed the significance criteria described in Section 4 (Table 4-2)?

⁶ Total Project operational noise levels as shown on Table 9-2.

⁷ Represents the combined existing ambient conditions plus the Project activities, and the noise level increase expected with the addition of the proposed Project activities.

⁸ Represents the combined ambient conditions plus the Project activities plus the cumulative development activities.





9.7 OPERATIONAL NOISE MITIGATION MEASURES

With the noise mitigation measures (MM) recommended below, the normal operation of the Project will not exceed the County of Riverside standards for stationary-source noise impacts. As previously shown on Table 9-2, the recommended 8-foot high noise barriers will reduce the noise levels at receiver location R6 by 11 dBA to satisfy the County of Riverside General Plan Noise Element 45 dBA Leq nighttime noise level standards. It is recommended that the Lead Agency require the following as Project Conditions of Approval:

MM Noise-1:

- Construct 8-foot high noise barriers at the southern property line of the Building D site at the topof-slope elevation, as shown on Exhibit 9-A.
- All on-site operating equipment under the control of the building user that is used in outdoor areas (including but not limited to trucks, tractors, forklifts, and hostlers), shall be operated with properly functioning and well-maintained mufflers.
- Maintain quality pavement conditions on the property that are free of vertical deflection (i.e. speed bumps) to minimize truck noise.
- Should any of the buildings within the Project include special noise generators, such as outdoor compressors, air scrubbers, heavy materials handlings, HVAC units, emergency generators, or outdoor amplification (speakers), the following shall be required as conditions of the occupancy permit:
 - An acoustical study shall be required to determine the noise impacts, if any, to nearby sensitive receivers due to special noise generators and recommend any necessary noise mitigation measures.
 - The study shall analyze the noise levels received at adjacent sensitive land uses to satisfy the appropriate jurisdiction's noise level standards; and
 - The study shall determine the significance of noise level contributions from the operation of special noise generators based on the significance criteria below when the ambient noise levels at nearby sensitive receivers:
 - are less than 60 dBA and the project creates a *readily perceptible* 5 dBA or greater project related noise level increase; or
 - range from 60 to 65 dBA and the project creates a *barely perceptible* 3 dBA or greater project noise level increase; or
 - already exceed 65 dBA, and the project creates a community noise level impact of greater than 1.5 dBA.
 - The study shall identify the noise attenuation measures needed to meet the above performance standards, and Riverside County shall require the implementation of such measures.
- The truck access gates and loading docks within the truck court on the Project site shall be posted with signs which state:
 - Truck drivers shall turn off engines when not in use;
 - Diesel trucks servicing the Project shall not idle for more than five (5) minutes; and



• Post telephone numbers of the building facilities manager to report violations.

9.8 OPERATIONAL VIBRATION IMPACTS

Although the human threshold of perception for vibration is around 65 VdB, human response to vibration is not usually significant unless the vibration exceeds 70 VdB. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement condition. Typical vibration levels for heavy trucks at normal traffic speeds do not exceed 65 VdB. Truck deliveries transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts nearby homes will be less than significant.



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10 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project.

10.1 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project, the County has established limits to the hours of operation. Section 9.52.020 of the County's Noise Regulation ordinance, provided in Appendix 3.1, indicates that noise associated with any private construction activity located within one-quarter of a mile from an inhabited dwelling is considered exempt between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. (13) Neither the County's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*.

To allow for a quantified determination of what the Noise Control Ordinance constitutes as noise that *may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life* due to Project construction activity, relevant quantified stationary source noise standards established in the General Plan, Policy N 4.1, are used in this analysis to assess the Project construction noise levels at nearby sensitive receivers. Therefore, the daytime noise level standard of 65 dBA Leq is used to evaluate the potential Project-related construction noise impacts. (12)

10.2 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following seven stages:

- Demolition
- Grading
- Underground Utilities
- Building Construction
- Landscaping
- Paving & Site Finishes
- Architectural Finishes

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements, provided in Appendix 10.1, represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to in excess of 80 dBA



when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages used in this analysis are consistent with the data used to support the construction emissions in the *Knox Business Park Air Quality Impact Analysis* prepared by Urban Crossroads Inc. (20)

10.3 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 10-1 provides a summary of the 16-construction reference noise level measurements. Since the reference noise levels were collected at varying distances, all construction noise level measurements presented on Table 10-1 have been adjusted to describe a common reference distance of 50 feet. Appendix 10.1 includes a detailed construction reference noise level memo and reference noise source photos for each type of construction activity.

OFF-SITE CONSTRUCTION ACTIVITIES

In addition to the Project construction phases, off-site improvements may occur in relation to the construction of the Project. At the time of this analysis, the nature of the off-site improvements was unknown, however, as with the on-site construction phases, the hours will be limited by the Municipal Code and enforced by the County of Riverside. Also, implementation of the construction noise mitigation measures, described in Section 10.6, will ensure that further noise level increases associated with any off-site construction activities are reduced. The noise levels associated with off-site construction activities at the nearby sensitive land uses are not expected to exceed those already calculated to occur for other construction-related activities when equipment is operating along the Project site perimeter.



ID	Noise Source	Reference Distance From Source	Refer Noise @ Referen	rence Levels ce Distance	Reference Noise Levels @ 50 Feet ⁶	
		(Feet)	dBA Leq	dBA Lmax	dBA Leq	dBA Lmax
1	Truck Pass-Bys & Dozer Activity ¹	30'	63.6	68.1	59.2	63.7
2	Dozer Activity ¹	30'	68.6	76.4	64.2	72.0
3	Construction Vehicle Maintenance Activities ²	30'	71.9	74.8	67.5	70.4
4	Foundation Trenching ²	30'	72.6	74.9	68.2	70.5
5	Rough Grading Activities ²	30'	77.9	84.8	73.5	80.4
6	Residential Framing ³	30'	66.7	76.7	62.3	72.3
7	Water Truck Pass-By & Backup Alarm ⁴	30'	76.3	82.3	71.9	77.9
8	Dozer Pass-By ⁴	30'	84.0	89.9	79.6	85.5
9	Two Scrapers & Water Truck Pass-By ⁴	30'	83.4	89.0	79.0	84.6
10	Two Scrapers Pass-By ⁴	30'	83.7	86.9	79.3	82.5
11	Scraper, Water Truck, & Dozer Activity ⁴	30'	79.7	87.7	75.3	83.3
12	Concrete Mixer Truck Movements ⁵	50'	71.2	73.1	71.2	73.1
13	Concrete Paver Activities ⁵	30'	70.0	75.7	65.6	71.3
14	Concrete Mixer Pour & Paving Activities ⁵	30'	70.3	76.3	65.9	71.9
15	Concrete Mixer Backup Alarms & Air Brakes⁵	50'	71.6	78.8	71.6	78.8
16	Concrete Mixer Pour Activities ⁵	50'	67.7	79.2	67.7	79.2

TABLE 10-1: CONSTRUCTION REFERERNCE NOISE LEVELS

¹As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.

² As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.

³ As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.

⁴ As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.

⁵ Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.

⁶ Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).





10.4 CONSTRUCTION NOISE ANALYSIS

Tables 10-2 to 10-8 show the Project construction stages and the reference construction noise levels used for each stage. Table 10-9 provides a summary of the noise levels from each stage of construction at each of the sensitive receiver locations. Based on the reference construction noise levels, the Project-related construction noise levels when the peak reference noise level is operating at a single point nearest the sensitive receiver location will range from 47.6 to 67.9 dBA Leq.

Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Dozer Pass-By	79.6
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-2: DEMOLITION EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	47.6
R2	1,141'	-27.2	0.0	52.4
R3	1,044'	-26.4	0.0	53.2
R4	631'	-22.0	0.0	57.5
R5	780'	-23.9	0.0	55.7
R6	191'	-11.6	0.0	67.9
R7	814'	-24.2	0.0	55.3
R8	1,163'	-27.3	0.0	52.2

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 3}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Dozer Pass-By	79.6
Scraper, Water Truck, & Dozer Activity	75.3
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-3: GRADING EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	47.6
R2	1,141'	-27.2	0.0	52.4
R3	1,044'	-26.4	0.0	53.2
R4	631'	-22.0	0.0	57.5
R5	780'	-23.9	0.0	55.7
R6	191'	-11.6	0.0	67.9
R7	814'	-24.2	0.0	55.3
R8	1,163'	-27.3	0.0	52.2

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

² Distance from the nearest point of construction activity to the nearest receiver. ³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Foundation Trenching	68.2
Dozer Pass-By	79.6
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-4: UNDERGROUND UTILITIES EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	47.6
R2	1,141'	-27.2	0.0	52.4
R3	1,044'	-26.4	0.0	53.2
R4	631'	-22.0	0.0	57.5
R5	780'	-23.9	0.0	55.7
R6	191'	-11.6	0.0	67.9
R7	814'	-24.2	0.0	55.3
R8	1,163'	-27.3	0.0	52.2

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 3}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Foundation Trenching	68.2
Water Truck Pass-By & Backup Alarm	71.9
Dozer Pass-By	79.6
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-5: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	47.6
R2	1,141'	-27.2	0.0	52.4
R3	1,044'	-26.4	0.0	53.2
R4	631'	-22.0	0.0	57.5
R5	780'	-23.9	0.0	55.7
R6	191'	-11.6	0.0	67.9
R7	814'	-24.2	0.0	55.3
R8	1,163'	-27.3	0.0	52.2

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

² Distance from the nearest point of construction activity to the nearest receiver. ³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Dozer Pass-By	79.6
Two Scrapers & Water Truck Pass-By	79.0
Two Scrapers Pass-By	79.3
Peak Reference Noise Level at 50 Feet (dBA Leq):	79.6

TABLE 10-6: LANDSCAPING EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	47.6
R2	1,141'	-27.2	0.0	52.4
R3	1,044'	-26.4	0.0	53.2
R4	631'	-22.0	0.0	57.5
R5	780'	-23.9	0.0	55.7
R6	191'	-11.6	0.0	67.9
R7	814'	-24.2	0.0	55.3
R8	1,163'	-27.3	0.0	52.2

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

² Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 3}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Peak Reference Noise Level at 50 Feet (dBA Leq):	71.6

TABLE 10-7: PAVING & SITE FINISHES EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	39.6
R2	1,141'	-27.2	0.0	44.4
R3	1,044'	-26.4	0.0	45.2
R4	631'	-22.0	0.0	49.6
R5	780'	-23.9	0.0	47.7
R6	191'	-11.6	0.0	60.0
R7	814'	-24.2	0.0	47.4
R8	1,163'	-27.3	0.0	44.3

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

² Distance from the nearest point of construction activity to the nearest receiver. ³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



Reference Construction Activity ¹	Reference Noise Level @ 50 Feet (dBA Leq)
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Peak Reference Noise Level at 50 Feet (dBA Leq):	68.2

TABLE 10-8: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Receiver Location	Distance To Construction Activity (Feet) ²	Distance Attenuation (dBA Leq) ³	Estimated Noise Barrier Attenuation (dBA Leq) ⁴	Construction Noise Level (dBA Leq)
R1	1,992'	-32.0	0.0	36.2
R2	1,141'	-27.2	0.0	41.0
R3	1,044'	-26.4	0.0	41.8
R4	631'	-22.0	0.0	46.1
R5	780'	-23.9	0.0	44.3
R6	191'	-11.6	0.0	56.5
R7	814'	-24.2	0.0	43.9
R8	1,163'	-27.3	0.0	40.8

¹ Reference construction noise level measurements taken by Urban Crossroads, Inc. (Appendix 10.1).

 $^{\rm 2}$ Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Estimated barrier attenuation from existing barriers in the Project study area.

10.5 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when mobile equipment is operating along the perimeter of the Project site. As shown on Table 10-9, the unmitigated peak construction noise levels are expected to range from 47.6 to 67.9 dBA Leq. Construction activities are estimated to occur during the permitted hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May, based on the County of Riverside Municipal Code noise standards.



	Distance to	Construction Phase Hourly Noise Level (dBA Leq)								
Noise Receiver ¹	Const. Activity (Feet)	Demo.	Grading	Utilities	Building Const.	Landscape	Paving	Arch.	Peak ²	
R1	1,992'	47.6	47.6	47.6	47.6	47.6	39.6	36.2	47.6	
R2	1,141'	52.4	52.4	52.4	52.4	52.4	44.4	41.0	52.4	
R3	1,044'	53.2	53.2	53.2	53.2	53.2	45.2	41.8	53.2	
R4	631'	57.5	57.5	57.5	57.5	57.5	49.6	46.1	57.5	
R5	780'	55.7	55.7	55.7	55.7	55.7	47.7	44.3	55.7	
R6	191'	67.9	67.9	67.9	67.9	67.9	60.0	56.5	67.9	
R7	814'	55.3	55.3	55.3	55.3	55.3	47.4	43.9	55.3	
R8	1,163'	52.2	52.2	52.2	52.2	52.2	44.3	40.8	52.2	

TABLE 10-9: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

¹Noise receiver locations are shown on Exhibit 8-A.

² Estimated construction noise levels during peak operating conditions.

Based on the construction noise standards described in Section 3.4, the potential short-term unmitigated construction noise level impacts are expected to exceed the acceptable construction noise level threshold of 65 dBA Leq at one of the sensitive receiver locations, R6, during the permitted hours of construction activity near the property line. Therefore, a 6-foot high temporary construction noise barrier is required at the southern construction boundaries near receiver location R6 where Project construction noise levels could potentially exceed the noise level thresholds, as shown on Exhibit 10-A. With the installation of temporary exterior noise control barriers with a minimum height of 6-feet, construction noise levels at the nearby residential receivers would be reduced.

This analysis does not evaluate the feasibility of temporary noise barrier installation. If it is not feasible to install temporary barriers, construction noise levels would not be reduced, because no other measures exist to reasonably reduce construction noise levels. The noise attenuation provided through temporary noise barriers depends on many factors including cost, wind loading, the location of the receiver, and the ability to place barriers such that the line-of-sight of the receiver is blocked to the noise source, among others. This analysis assumes a temporary noise barrier constructed using frame-mounted materials such as vinyl acoustic curtains or quilted blankets.





EXHIBIT 10-A: TEMPORARY CONSTRUCTION NOISE BARRIER LOCATION



6' Temporary Construction Noise Barrier Height (in feet) 🕀 Receiver Locations Temporary Construction Noise Barrier





Table 10-10 shows the peak construction noise levels are expected to range from 47.6 to 61.2 dBA Leq with the attenuation provided by the temporary construction noise barrier. With the minimum 6-foot high temporary noise control barrier, the construction noise levels will satisfy the 65 dBA Leq construction noise level threshold at the closest receiver location, R6. Therefore, the construction of the Project will result in a *less than significant* impact after mitigation at the nearby sensitive receiver locations during peak construction activity.

	Const. N	Noise Levels (c	lBA Leq)	With Temporary Noise Barriers			
Receiver Location ¹	Peak Activity (dBA Leq) ²	Threshold (dBA Leq) ³	Threshold Exceeded? ⁴	Attenuation (dBA Leq)	Construction Noise Levels (dBA Leq)⁵	Threshold Exceeded? ⁴	
R1	47.6	65	No	0	47.6	No	
R2	52.4	65	No	0	52.4	No	
R3	53.2	65	No	0	53.2	No	
R4	57.5	65	No	0	57.5	No	
R5	55.7	65	No	0	55.7	No	
R6	67.9	65	Yes	-6.7	61.2	No	
R7	55.3	65	No	0	55.3	No	
R8	52.2	65	No	0	52.2	No	

TABLE 10-10: MITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

¹Noise receiver locations are shown on Exhibit 8-A.

² Estimated construction noise levels during peak operating conditions, as shown on Table 10-9.

³ Construction noise standards as shown on Table 3-2.

⁴ Do the estimated Project construction noise levels meet the construction noise level thresholds?

⁵ Peak construction noise levels with the minimum 6-foot high temporary construction noise barrier as shown on Exhibit 10-A. Temporary barrier attenuation calculations are provided in Appendix 10.2.

10.6 CONSTRUCTION NOISE MITIGATION MEASURES

Though construction noise is temporary, intermittent and of short duration, and will not present any long-term impacts, the following practices would reduce any noise level increases produced by the construction equipment to the nearby noise-sensitive residential land uses:

MM Noise-2:

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that noise-generating Project construction activities that would create noise levels of greater than 45 dBA Leq at sensitive receivers shall only occur between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May. The Project construction supervisor shall ensure compliance with the note and the County shall conduct periodic inspection at its discretion.
- Install a minimum 6-foot high temporary noise control barrier, as shown on Exhibit 10-A, at the southern Project site boundaries near receiver location R6. The noise control barrier must present a solid face from top to bottom. The noise control barrier must be a minimum height of 6-feet.



- The noise barrier may be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts.
- The noise barriers must be maintained and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired.
- The noise control barriers and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site (i.e., to the center) during all Project construction.
- The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment (between the hours of 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May). The contractor shall prepare a haul route exhibit and shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.
- The following blasting noise and vibration monitoring and abatement plan shall be adopted and submitted to the County prior to commencement of blasting activities:
 - Pre-blasting inspections shall be offered to property owners within 200 feet of the blast site.
 - Existing damage of each structure shall be documented.
 - Post-blasting inspections shall be offered to assess new or additional damage to each structure once blasting activities have ceased for those property owners who accepted pre-blast inspections.
 - Property owners within at least 200 feet of the blast site shall be notified via postings on the construction site at least 24 hours before the occurrence of major constructionrelated noise and vibration impacts (such as grading and rock blasting) which may affect them.
 - The County may impose conditions and procedures on the blasting operations as necessary. The construction contractor shall comply with these measures for the duration of the blasting permit. The County may inspect the blast site and materials at any reasonable time (County of Riverside Ordinance No. 787).

10.7 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent,



localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage. It is not expected that heavy equipment such as large bulldozers would operate close enough to any residences or buildings to cause a vibration impact.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading and paving. Using the vibration source level of construction equipment provided on Table 6-7 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 10-11 presents the expected Project related vibration levels at the eight receiver locations.

	Distance to		Receiver	RMS	Potential			
Noise Receiver ¹	Noise Receiver ¹ Construction (Feet)	Small Bulldozer	Jack- hammer	Loaded Trucks	Large Bulldozer	Peak Vibration	Levels (in/sec) ³	Significant Impact? ⁴
R1	1,485'	0.0000	0.0001	0.0002	0.0002	0.000	0.000	No
R2	537'	0.0000	0.0004	0.0008	0.0009	0.001	0.001	No
R3	612'	0.0000	0.0003	0.0006	0.0007	0.001	0.001	No
R4	418'	0.0000	0.0005	0.0011	0.0013	0.001	0.001	No
R5	780'	0.0000	0.0002	0.0004	0.0005	0.001	0.000	No
R6	191'	0.0001	0.0017	0.0036	0.0042	0.004	0.003	No
R7	814'	0.0000	0.0002	0.0004	0.0005	0.000	0.000	No
R8	1,163'	0.0000	0.0001	0.0002	0.0003	0.000	0.000	No

TABLE 10-11: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

¹Receiver locations are shown on Exhibit 8-A.

² Based on the Vibration Source Levels of Construction Equipment included on Table 6-7.

³ Vibration levels in PPV are converted to RMS velocity using a 0.71 conversion factor identified in the Caltrans Transportation and

Construction Vibration Guidance Manual, September 2013.

⁴ Does the peak vibration exceed the County of Riverside maximum acceptable vibration standard of 0.01 in/sec?

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference velocity of 0.089 in/sec (PPV) at 25 feet. At distances ranging from 191 to 1,485 feet from the Project site, construction vibration velocity levels are expected to approach 0.004 in/sec (PPV), as shown on Table 10-11. To assess the human perception of vibration levels in PPV, as previously discussed in Section 3.5.1, the velocities are converted to RMS vibration levels based on the Caltrans *Transportation and Construction*

Vibration Guidance Manual conversion factor of 0.71. Table 10-11 shows the construction vibration levels in RMS are expected to approach 0.003 in/sec (RMS) at the eight receiver locations. Based on the County of Riverside vibration standards, the proposed Project construction activities will not include or require equipment, facilities, or activities that would result in a *barely perceptible* human response (annoyance), and therefore, the construction-related vibration impacts are considered *less than significant*.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating along the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with County of Riverside requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

10.8 BLASTING NOISE AND VIBRATION ANALYSIS

The construction of the proposed Project will include blasting of hard rock areas, which is a major source of potential noise impacts to nearby residential receivers. The intensity of the noise and vibration impacts associated with rock blasting depends on location, size, material, shape of the rock, and the methods used to crack it. While a blasting contractor can design the blasts to stay below a given vibration level that could cause damage to nearby sensitive structures, it is difficult to design blasts that produce noise levels which are not perceptible to receivers in the vicinity of the blast site. (3) The noise produced by blasting activities is referred to as an airblast, or a pressure wave that is generated when explosive energy in the form of gases escape from the detonating blast holes. Much like a point source, airblasts radiate outward in a spherical pattern and attenuate with each doubling of distance from the blast location. (21)

Blasting activities generally include: the pre-drilling of holes in the hard rock area; preparation and placement of the charges in the drilled holes; a pre-blast horn signal; additional pre-blast horn signals immediately prior to the blast; and the blast itself. An additional horn signal is sounded to indicate the "all clear" after the blast and the blasting contractor has inspected the blasting area. During the blast, which occurs over a few seconds, the noise from the blast itself starts with a cracking sound from the detonator, located at a distance from the charges, and ends with the low crackling sound from each charge as they are subsequently set off. It is important to note that no other construction equipment will be operating during the blast in the immediate area, and will commence once the blasting contractor indicates it is safe to do so.

The worst-case blasting activities associated with Project construction are expected to include 15 sections of approximately 400 holes per blast over a two-month period. This equates to roughly 15 separate blasting events. Using conventional blasting methods, there will be one blast near the edge of the southern property line using holes as deep as 15 to 20 feet. The explosive charges are placed in each hole to fragment the rocks into smaller, crushable pieces. The charges will be made up of ammonium nitrate/fuel oil (ANFO) which consists of 94 percent ammonium nitrate and 6 percent diesel fuel. Further, the blasts will be single-event noise sources which occur over a few seconds, with multiple small blasts in each hole occurring milliseconds apart from each other. Once the blast is completed, normal construction grading activities will resume. An



electric rock crusher will later break down the fragmented rocks at the Project site and will be powered by a 300-horsepower diesel generator. The noise and vibration levels expected due to blasting activities during Project construction are discussed below.

10.8.1 BLASTING NOISE LEVELS

To evaluate the potential noise levels from blasting activities during Project construction, Urban Crossroads, Inc. collected a reference noise level measurement of a single blast performed by the same contractor for the Project, California Blasting and Drilling, on March 15th, 2016 at a residential construction site in Chatsworth. At a reference distance of 370 feet, the blasting noise levels reached 81.5 dBA Lmax for one second over a total duration of 7 seconds for all blasts included in the event. The reference blast measurement represents a larger blasting area and greater amount of ANFO explosive material than what is planned at the Project site. In addition, due to the distance of roughly 400 feet to nearby residential homes of the reference blast site, some debris was allowed to be cast into the air and the additional noise associated with this debris is included in the reference noise level. Debris due to blasting at the Project site is not anticipated to be cast into the air per conversations with the blasting contractor, and therefore, the reference noise level measurement may conservatively overstate the noise levels of the Project site blasting activities. Table 10-12 shows the blasting noise level at the closest receiver location, R6, using the reference noise level measurement taken by Urban Crossroads, Inc. The additional attenuation provided by the recommended temporary noise barrier is included in the blasting noise levels at receiver location R6.

Reference Construction Activity ¹	Reference Noise Level @ 370 Feet (dBA Lmax)
Blasting	81.5
Peak Reference Noise Level at 370 Feet:	81.5

TABLE 10-12: BLASTING NOISE LEVELS

Receiver Location	Distance To Property Line Activity (Feet) ²	Distance Attenuation (dBA) ³	Calculated Noise Barrier Attenuation (dBA) ⁴	Blasting Noise Level (dBA Lmax)
R6	191'	5.7	-6.7	80.5

¹ As measured by Urban Crossroads, Inc. on 3/15/2016 at a construction site in Chatsworth.

² Distance from the nearest point of construction activity to the nearest receiver.

³ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

⁴ Calculated barrier attenuation from existing barriers in the Project study area (Appendix 10.2).

The County of Riverside General Plan and Municipal Code do not identify specific construction noise level limits for blasting activities. Therefore, the OSMRE and CFR lowest maximum *Airblast Limit* (30 CFR 816.67(b)) of 129 dBA Lmax at nearby sensitive uses is used in this analysis as an acceptable threshold for noise levels due to blasting activity at the Project site, as previously



discussed in Section 3.6. (2) Based on the reference blasting noise level, the closest residential receiver will experience noise levels approaching 80.5 dBA Lmax over the course of the blast, which will likely occur for only a few seconds. While some blasting noise may be noticeable by nearby residents, the single-event, temporary noise levels generated by the blast will not exceed the OSMRE and the CFR standards for airblasts, and therefore, will result in a *less than significant* noise impact.

10.8.2 BLASTING VIBRATION LEVELS

Based on the California Department of Transportation's *Transportation and Construction Vibration Guidance Manual*, it is unusual for damage to be caused to residential structures from the vibrations due to blasting activities as other agencies' (U.S. Bureau of Mines and the Office of Surface Mining and Reclamation Enforcement) maximum vibration level limits have been shown to fail to cause any damage to existing homes. Often existing damage is perceived to have been due to nearby blasting operations as the detonation of the blast causes closer examination by homeowners of the structural integrity of their home. (3)

The *Transportation and Construction Vibration Guidance Manual* provides the human perception thresholds for vibration from continuous events at a peak particle velocity (PPV) level of 0.02 in/sec, and provides vibration velocity levels for various building materials susceptibility to damage. For residential structures, the threshold of damage for vibration is approximately 3.0 in/sec (PPV) for cosmetic cracking and damage. (3) While determining the vibration levels from the blasting operations at the Project site is difficult due to the variability of conditions at the site, it is possible to monitor and prevent vibration levels to the extent feasible with a monitoring and abatement plan. To prevent damage to nearby residential structures, the following steps are recommended, consistent with the *Transportation and Construction Vibration Guidance Manual Procedures for Mitigating Blast Vibration and Air Overpressure from Construction Blasting:* (3)

- Identify potential problem areas surrounding the Project site.
- Determine the conditions that exist prior to commencement of construction.
- Inform the public about the Project and potential blasting-related consequences.
- Schedule the work to reduce adverse effects.
- Design the blast to reduce vibration and air over pressure.
- Use blast signals to notify nearby residents that blasting is imminent.
- Monitor and record the vibration and air overpressure effects of the blast.
- Respond to and investigate complaints.

By incorporating the above steps, the vibration levels at nearby residential receivers will be reduced. A pre and post-blast survey radius of approximately 200 feet is recommended to assess the potential vibration level radius due to blasting activities and shall include the inspection of the closest residential structures. Existing defects or damage should be noted and documented to determine the conditions of the closest residential homes, and surveys should be offered to homeowners to assess such damage. Neighborhood meetings, notifications, or posting of signs



are all recommended to notify nearby homeowners of the blasting activities. To reduce adverse effects, rock blasting activities will be limited during the permitted hours for construction activity between 6:00 a.m. and 6:00 p.m., during the months of June through September, and 7:00 a.m. and 6:00 p.m., during the months of October through May, as required by the County of Riverside Municipal Code. (13) Further, the blasting contractor shall design the blasts when located within 200 feet of existing residential structures to reduce vibration velocity levels from each blast below the damage threshold of 3.0 in/sec. A blast signal shall be used to notify nearby residents that blasting is about to occur. Lastly, all complaints must be responded to and investigated as they occur. The major source of vibration due to rock blasting is expected to be from the charges placed in each drill hole within the Project site. Due to the ability of the blasting contractor to limit the ground-borne vibration levels, the vibration velocity levels at 191 feet to the nearest sensitive receiver are expected to be *less than significant*.



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11 REFERENCES

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- 20. Urban Crossroads, Inc. Knox Business Park Air Quality Impact Analysis. June 2015.
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12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Knox Business Park Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

BILL LAWSON, P.E., INCE

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STATEMENT OF QUALIFICATIONS

Bill Lawson is a Registered Professional Traffic Engineer and a Certified Acoustical Consultant. His educational background includes a Master's Degree in Civic and Environmental Engineering and a Bachelor's Degree in City and Regional Planning from Cal Poly San Luis Obispo. Mr. Lawson maintains a wide range of technical expertise that includes transportation planning, traffic engineering, neighborhood traffic control, and noise impact analysis.

EDUCATION

Master of Science in Civil and Environmental Engineering California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009 AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012 PTP – Professional Transportation Planner • May, 2007 – May, 2013 INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011 FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013



ALEX WOLFE

Assistant Analyst URBAN CROSSROADS, INC. 260 E. Baker Street, Suite 200 Costa Mesa, CA 92626 (949) 336-5977 awolfe@urbanxroads.com

STATEMENT OF QUALIFICATIONS

Alex Wolfe has worked on a variety of noise projects for Urban Crossroads as an analyst. He has been involved in the analysis and reporting of noise impacts to and from development projects using the Federal Highway Administration (FHWA) Traffic Noise Model (TNM), and Geographic Information Systems (GIS) to graphically represent existing and future noise environments. He received his Bachelor's Degree in Urban Studies from the University of California, Irvine in 2012.

EDUCATION

Bachelor of the Arts in Urban Studies University of California, Irvine • June, 2012





APPENDIX 3.1:

COUNTY OF RIVERSIDE MUNICIPAL CODE



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Chapter 9.52 - NOISE REGULATION **Sections:**

9.52.010 - Intent.

At certain levels, sound becomes noise and may jeopardize the health, safety or general welfare of Riverside County residents and degrade their quality of life. Pursuant to its police power, the board of supervisors declares that noise shall be regulated in the manner described in this chapter. This chapter is intended to establish county-wide standards regulating noise. This chapter is not intended to establish thresholds of significance for the purpose of any analysis required by the California Environmental Quality Act and no such thresholds are established.

(Ord. 847 § 1, 2006)

9.52.020 - Exemptions.

Sound emanating from the following sources is exempt from the provisions of this chapter:

- A. Facilities owned or operated by or for a governmental agency;
- B. Capital improvement projects of a governmental agency;
- C. The maintenance or repair of public properties;
- D. Public safety personnel in the course of executing their official duties, including, but not limited to, sworn peace officers, emergency personnel and public utility personnel. This exemption includes, without limitation, sound emanating from all equipment used by such personnel, whether stationary or mobile;
- E. Public or private schools and school-sponsored activities;
- F. Agricultural operations on land designated "Agriculture" in the Riverside County general plan, or land zoned A-I (light agriculture), A-P (light agriculture with poultry), A-2 (heavy agriculture), A-D (agriculture-dairy) or C/V (citrus/vineyard), provided such operations are carried out in a manner consistent with accepted industry standards. This exemption includes, without limitation, sound emanating from all equipment used during such operations, whether stationary or mobile;
- G. Wind energy conversion systems (WECS), provided such systems comply with the WECS noise provisions of Riverside County Ordinance No. 348;
- H. Private construction projects located one-quarter of a mile or more from an inhabited dwelling;
- I. Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:
 - 1. Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and
 - 2. Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May;
- J. Property maintenance, including, but not limited to, the operation of lawnmowers, leaf blowers, etc., provided such maintenance occurs between the hours of seven a.m. and eight p.m.;

K.

Motor vehicles, other than off-highway vehicles. This exemption does not include sound emanating from motor vehicle sound systems;

- L. Heating and air conditioning equipment;
- M. Safety, warning and alarm devices, including, but not limited to, house and car alarms, and other warning devices that are designed to protect the public health, safety, and welfare;
- N. The discharge of firearms consistent with all state laws.

(Ord. 847 § 2, 2006)

9.52.030 - Definitions.

As used in this chapter, the following terms shall have the following meanings:

"Audio equipment" means a television, stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

"Decibel (dB)" means a unit for measuring the relative amplitude of a sound equal approximately to the smallest difference normally detectable by the human ear, the range of which includes approximately one hundred thirty (130) decibels on a scale beginning with zero decibels for the faintest detectable sound. Decibels are measured with a sound level meter using different methodologies as defined below:

- 1. "A-weighting (dBA)" means the standard A-weighted frequency response of a sound level meter, which de-emphasizes low and high frequencies of sound in a manner similar to the human ear for moderate sounds.
- 2. "Maximum sound level (L_{max})" means the maximum sound level measured on a sound level meter.

"Governmental agency" means the United States, the state of California, Riverside County, any city within Riverside County, any special district within Riverside County or any combination of these agencies.

"Land use permit" means a discretionary permit issued by Riverside County pursuant to Riverside County Ordinance No. 348.

"Motor vehicle" means a vehicle that is self-propelled.

"Motor vehicle sound system" means a stereo, radio, tape player, compact disc player, mp3 player, I-POD or other similar device.

"Noise" means any loud, discordant or disagreeable sound.

"Occupied property" means property upon which is located a residence, business or industrial or manufacturing use.

"Off-highway vehicle" means a motor vehicle designed to travel over any terrain.

"Public or private school" means an institution conducting academic instruction at the preschool, elementary school, junior high school, high school, or college level.

"Public property" means property owned by a governmental agency or held open to the public, including, but not limited to, parks, streets, sidewalks, and alleys.

APPENDIX 5.1:

STUDY AREA PHOTOS



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L1 33, 51' 38.158200", 117, 16' 44.013000"

L1_2 33, 51' 38.158200", 117, 16' 44.013000"



L1_E 33, 51' 38.158200", 117, 16' 44.013000"

L1_N 33, 51' 38.158200", 117, 16' 44.013000"



L1_NE 33, 51' 38.158200", 117, 16' 44.013000"

L1_NW 33, 51' 38.158200", 117, 16' 44.013000"



L1_S 33, 51' 38.158200", 117, 16' 44.013000"

L1_S2 33, 51' 38.158200", 117, 16' 44.013000"



L1_SE 33, 51' 38.158200", 117, 16' 44.013000"



L1_W 33, 51' 38.158200", 117, 16' 44.013000"



L2 33, 51' 21.967100", 117, 16' 43.793300"

L2_2 33, 51' 21.967100", 117, 16' 43.793300"



L2_E 33, 51' 21.967100", 117, 16' 43.793300"

L2_E2 33, 51' 21.967100", 117, 16' 43.793300"





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L2_SE 33, 51' 21.967100", 117, 16' 43.793300"



L2_SW 33, 51' 21.967100", 117, 16' 43.793300"

L3 33, 51' 19.852200", 117, 16' 37.036700"



L3_2 33, 51' 19.852200", 117, 16' 37.036700"

L3_E 33, 51' 19.852200", 117, 16' 37.036700"



L3_E2 33, 51' 19.852200", 117, 16' 37.036700"

L3_N 33, 51' 19.852200", 117, 16' 37.036700"



L3_N2 33, 51' 19.852200", 117, 16' 37.036700"

L3_NE 33, 51' 19.852200", 117, 16' 37.036700"



L3_NE2 33, 51' 19.852200", 117, 16' 37.036700"

L3_NW 33, 51' 19.852200", 117, 16' 37.036700"



L3_S 33, 51' 19.852200", 117, 16' 37.036700"

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L5_S2 33, 51' 31.497800", 117, 15' 43.807900"



L5_S3 33, 51' 31.497800", 117, 15' 43.807900"

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L6_2 33, 51' 7.163000", 117, 16' 12.784400"

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L6_W2 33, 51' 7.163000", 117, 16' 12.784400"



L7 33, 51' 4.265400", 117, 15' 56.771800"

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L7_E 33, 51' 6.778500", 117, 15' 59.710600"

L7_N 33, 51' 6.778500", 117, 15' 59.710600"



L7_N2 33, 51' 6.778500", 117, 15' 59.710600"

L7_NE 33, 51' 6.778500", 117, 15' 59.710600"



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L7_SW 33, 51' 6.778500", 117, 15' 59.710600"

L7_W 33, 51' 6.778500", 117, 15' 59.710600"



Site_Old Oleander Av_S 33, 51' 32.060800", 117, 16' 1.798000"

Site_Old Oleander Av_S2 33, 51' 32.060800", 117, 16' 1.798000"



Site_Old Oleander Av_SE 33, 51' 32.060800", 117, 16' 1.798000"

Site_Old Oleander Av_SE2 33, 51' 32.060800", 117, 16' 1.798000"



Site_Old Oleander Av_SW 33, 51' 32.060800", 117, 16' 1.798000"

Site_Old Oleander Av_W 33, 51' 32.060800", 117, 16' 1.798000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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9349	A. Wolfe	3/31- 4/1/2015		ute)			9.2	29	: '9 †	17 18	OT /T	L50%	39.5 46.0	43.0	41.0	44.0	42.6		43.0	41.0	43.0	41.5	44.0 41 E	2 UC	6.95 40.0	41.5	43.0 41 E	40.0	41.0	42.5	44.0	C L	45.0 43.0	45.0 43.0 42.5	45.0 43.0 42.5 46.0	45.0 43.0 42.5 45.0 44.0	45.0 43.0 42.5 46.0 45.0 43.0
:Nſ	Analyst:	Date:						3 2	: 0 5	ןה 16		LZ5%	40.5 53.0	46.3	42.0	45.0	43.9		44.0	42.U 44.5	45.0	43.0	45.0	43.0	40.5 41.5	43.0	46.3	43.0	42.0	44.5	46.5		47.5 45.0	47.5 45.0 45.0	47.5 45.0 45.0 53.0	47.5 45.0 45.0 53.0 49.0 45.5	47.5 45.0 45.0 53.0 49.0 45.5 44.5
								s	•9t	13	+T CT 1	78%	42.5 61.5	52.5	43.0	48.0	45.8		45.0	43.0 47.5	48.0	44.5	46.0	2.44 J CA	42.5 43.5	44.5	52.5 47 E	44.5	44.5	46.5	49.5	r	47.5	47.5 51.5	47.5 51.5 61.5	47.5 51.5 61.5 55.5 48.5	47.5 51.5 61.5 55.5 48.5 46.6
	et near	5		eq (Average)				۷.95	. 87 5	11 12	TT Reginning	۲5%	44.5 67.0	57.8	44.0	50.0	47.2	iummary	46.0	44.0 50.0	49.5	45.5	47.0 45 E	3 4 4	44.5 46.0	46.0	57.8 E2.0	46.5	47.5	47.5	52.5	0.2C	49.0	49.0 57.5	49.0 57.5 67.0	49.0 57.5 67.0 62.5 50.5	49.0 57.5 67.0 62.5 50.5 48.5
	and Dav Stree					L		t.8;	S	0 		%71	47.0 74.5	65.4	45.0	53.0	49.6	Hourly S	47.5	45.0 53.0	51.0	50.0	49.5	47.0	47.U 50.5	50.0	65.4 63 E	52.5	52.0	48.5	57.0	0.65	52.5	52.5 66.5	52.5 66.5 74.5	52.5 66.5 74.5 70.5 53.0	52.5 66.5 74.5 70.5 53.0 53.0
	orson Avenue							5	·97	×	0	%T1	49.5 77.5	68.7	46.0	56.0	52.4		48.0	46.U 55.0	53.0	56.0	53.5	40.0	55.5	55.0	68.7 60.0	57.0	56.5	50.0	61.5	C.10	56.0	56.0 70.0	56.0 70.0 77.5	56.0 70.0 74.0 53.5	56.0 70.0 77.5 74.0 53.5 53.5 52.5
	est corner of (S	.24		D	ГШИ	36.8 40.8	38.8	37.9	41.2	39.5		40.5	39.1 39.5	40.7	37.9	41.2	5.15 7.70	37.8 37.8	37.9	38.8 20 F	36.8	37.9	38.7	39.6 20.7	39./	39.3	39.3 37.9	39.3 37.9 38.7	39.3 37.9 40.8 40.5	39.3 37.9 38.7 40.8 40.5 39.6
s Park	at the northw	ential homes.						6	.44.	- V	ר ד	Гтах	69.5 91.3	81.6	50.3	74.7	69.6		52.9	50.3 72.5	70.6	64.6	74.7 52 5	C.2C	75.7	76.1	81.6 70 o	73.0	71.3	76.2	72.3	/T.9	71.0	71.0 91.3	71.0 91.3 83.9	71.0 91.3 83.9 80.4 69.5	71.0 91.3 83.9 80.4 69.5 67.5
Knox Busines	11 - Located ;	existing resid	unadjusted)					T 8	*9t	۲ ۲	4	bət	44.5 63.6	56.4	41.8	47.5	45.2		43.7	41.8 46.8	46.1	44.9	47.5 47.5	2.24 7.1	44.5 46.5	48.4	56.4 56.7	48.7	46.5	46.5	49.5	50.3	46.5	46.5 62.6	46.5 62.6 63.6	46.5 62.6 53.6 59.6 46.6	46.5 62.6 63.6 59.6 46.6 45.4
roject Name:		Location:	BA Readings (8	•T7		-	Hour	Min Max	Average	Min	Max	Average		0,	1 2	æ	4	un u	0 6	~ ∞	6	10	12	13	14	15	ΠD	17	17 18	17 18 19	17 18 20 21	17 18 20 21 22
ď			Hourly Leg di	SO O	(A8) 75.0	b) k	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	20:0 20:0 7 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0	10H	35.0 -		lime Period	Day	Energy	Night	, 0 I	Energy.				Night									Day							Niske

ď	roject Name:	Knox Business	Park	7					:NL	9349	Energy Av	erage Lea	24-Hour
		ic hoterol - C I	long Dav Stree	at couth of Ru	-ch Street nea	r avicting rac	leituebi		Analyst:	A. Wolfe	Day	Night	CNEL
	Location:	homes.			הוו או בבר ווכמ		ותבוווומו		Date:	3/31- 4/1/2015	58.2	51.7	61.2
Hourly Leg di	BA Readings (unadjusted)								<u></u>			
80.0							Leq (Average)		—L2% (1 Min	ute)	%067 	(55 Minutes)	
(A8b) 75.0													
) bə]						3					S ۲۰		
ourly l	2.8 5.2	6.9 2.0	1.5	9.92	1.42		\$.32.4	0.2 4.92	4.72 4.22	2.09	°T9 E9	24.2	9'T
H 40.0	לי לד	5	S			5		S					S
	0 1	2 3	4 5	6 7	00	9 10	11 12	13 14	15 16	17 18	19 20	21 23	23
						Ħ	our Beginning						
Time Period	Hour	ред	Гтах	Lmin	L1%	L2%	72%	% 8 7	L25%	72 <i>0</i> %	%067	767	%667
Day	Min Max	51.6 63.7	73.7 87.6	37.6 39.5	65.0 77.5	62.5 75.0	55.0 69.0	47.0 63.5	42.5 55.8	40.0 47.0	37.5 42.0	37.5 41.5	37.5 41.0
Energy	Average	58.2	81.5	38.7	70.9	67.9	62.8	57.4	48.8	43.5	40.0	39.6	39.1
Night	Min	45.3	70.0	37.5	53.0	46.0	44.0	43.0	41.5	40.0	39.0	38.0	37.5
- L	Max	54.3	79.9	39.9	67.5	64.0	57.0	49.5	44.5	42.5	41.5	40.5	40.5
Energy	Average	51./	//.3	38.8	64.5	60.4	6.26	46.6	43.I	41.5	39.8	39.4	39.0
						Hourly	Summary						
	- 0	48.2 45.3	70.0	39.9 30.7	60.0 53.0	53.0 46.0	48.0 44.0	46.0 43.0	44.0 41 5	42.5 40 5	41.0 39.0	40.5 39.0	40.5 39 D
	2	50.5	79.4	39.1	59.0	51.0	44.0	43.0	42.0	41.0	39.5	39.5	39.0
Night	ς, γ	49.9	77.1	39.3 01.0	61.5	54.0	46.5	44.0	43.0	42.0	40.5	40.5	40.0
	4 v	52.1 53.4	79.9	37.6 202	66.5 66.5	62.5 63.0	53.5 57 0	46.0 49.0	41.5 44 5	40.0 47 5	39.0 41 5	38.0 40 5	37.5 40.0
	6	54.3	79.3	38.7	67.5	63.5	55.0	48.0	43.5	41.0	39.0	39.0	39.0
	2	56.6	79.6	37.6	69.5 63 r	67.0 67.0	62.0 -2.0	55.5	45.0	41.0	0.65	39.0 37.5	38.0 22 r
	00	54.1 51.6	74.4	37.6 37.6	67.5 65.5	0.00 62.5	55.0	47.0	43.5	40.0	39.0	39.0	37.5
	10	61.3	84.1	39.4	74.5	70.0	63.5	57.0	47.0	42.5	40.5	40.5	40.5
	11	56.4 53 1	73.7	38.5 37.6	68.5 66.5	64.5 63.0	59.0 58 5	52.5 52.0	43.5 43.5	40.5 40 5	39.0 37.5	39.0 37 5	39.0 37 5
	13	52.0	75.3	37.6	65.0	62.5	57.0	50.1	42.5	40.0	38.5	37.5	37.5
Day	14	56.4	81.0	39.0	68.0 63 r	65.0 67.0	60.0	53.5	45.0	42.0	40.0	39.5 10.5	39.0 20 F
	16 16	57.4	6.58 79.8	39.3 39.3	67.5	0.60	61.0 61.5	57.0	48.0 48.0	44.0 44.0	41.0 41.0	40.5 40.5	39.5 39.5
	17	55.3	74.1	39.2	68.0	66.0	62.5	57.5	48.5	44.0	40.5	40.0	39.0
	18	60.7	84.4	38.6	73.0 77 F	69.5 71 0	66.0	61.5 C2 F	51.0	44.5 47.0	40.0	39.0 40 F	39.0 20. r
	13 20	63.7 61.5	02.0 87.6	39.3	73.0	0.07	03.U 66.0	6.60 61.0	51.5	47.0	41.0	40.5 40.5	40.0
	21	54.2	77.0	39.5	67.5	64.5	57.0	50.5	48.0	46.5	42.0	41.5	41.0
Night	22	53.4	76.7	37.6 27.5	67.5	64.0 7.0.7	56.5	49.5 45 F	44.5	42.5	0.95 0.05	0.95 0.95	37.5 27.5
	52	0.10	1.11	C.15	03.0	C.8C	45.0	c.c4	47.D	4T.U	39.0	38.0	c./ɛ

CNEL	57.6
iy Night	.1 42.9
Volte <u>Va</u>) 1-	
Analyst: A. W. 3/31- Date: 4/1/2	
acent to existing	
Nance Street adja	
roject site along ⁿ	
uthwest of the Pr nes.	
L3 - Located so residential hom	(unodiusted)
Location:	dBA Readinas (
	Hour V Leo GH

our	7:	∞									-		%	5 0	4	5	0	4		0 1	റഗ	л го	5	ഗഗ		0 0	5	0 0	ъю	0	ы С п	nл	ъъ	ъ с		о г)
24-Hu	CNE	56.							7'	54	- <i>C</i>	i	667	35. 41	38.	39.	42.	40.		42.	39. 40.	40.	39.	41.	39.	38.	38.	41. 36	35.	36.	36.	38.	37.	36.	40. 40.	40.	
erage Leq	Night	44.6		(55 Minutes)					z.	57	- LC	1	L95%	36.5 43 0	39.2	39.5	42.5	40.9		42.5	41.0 41.0	41.0	40.5	42.0 40.5	39.5	38.0	39.0	41.0 36.5	36.5	36.5	37.0	39.0	38.0	37.0	43.U 41.0	41.0	
Energy Ave	Day	55.9		r90%				8.8	85		19 20	01	7067	36.5 43 5	39.7	40.0	42.5	41.2		42.5	40.0 41.0	41.5	41.0	42.5	40.0	38.5	39.5	41.5 37.0	36.5	36.5	37.5 20 E	39.5	38.5	37.5	43.0 42.0	41.5	
9349	A. Wolfe	3/31- 4/1/2015		ute)				8.18 8.18	9		17 18		L50%	38.0 46 5	42.1	42.0	44.5	43.0		44.5	42.U 42.5	42.5	42.0	44.0 72 F	425	40.0	41.5	43.5 40.0	38.0	38.5	40.0	42.0	41.0	40.5	45.0 45.0	43.5	2
S :NL	Analyst: ,	Date:		—L2% (1 Min				1	3.2		15 16		L25%	40.0 51.0	45.2	43.0	46.0	44.2		46.0	43.0	43.5	43.0	45.0 44.0	44.0	41.0	43.0	46.5 45.0	40.0	40.0	42.0 42.5	44.5	44.0	45.0	0.1.C 48.5	44.5	2
									8.(L.:	45	13 14	- - -	78%	42.0 57 5	51.1	44.0	47.5	45.4		47.5	44.0 44.5	44.5	44.0	46.0 45 5	45.0	43.0	45.0	54.5 51 5	42.0	43.0	44.0 46 E	40.5	49.5	54.5 13 1	5.4.5	47.5	2
	ent to			eq (Average)				7	Z.1	7 7	11 12	rr Reginning	L5%	44.0 63 5	58.2	45.0	49.0	46.5	ummary	49.0	45.0 45.5	45.0	45.0	46.5	46.5	44.5	46.5	63.0 62.0	44.0	45.0	45.5 48 E	40.3 52.0	57.5	62.5 52.5	6.5d 60.5	50.0	2
	ilding D. adiac	mung r, aujar		Le Le		L		6.	<u>۹</u> .	57	- 10	ICH	12%	47.5 69 5	64.3	45.5	52.0	48.3	Hourly Si	52.0	46.0 46.0	46.0	45.5	47.0 50.5	49.0	47.5	49.5	69.5 67 5	48.0	47.5	47.5 E0 E	59.0	68.0	68.0	66.0	52.0	
	ertv line of Ri	rive.							2:3	24	~)	L1%	48.5 73 5	67.9	46.0	57.0	51.6		57.0	46.0 46.0	46.5	46.5	47.5 56.0	50.5	50.0	52.5	72.0 69 5	56.5	48.5	48.5 EE E	66.0	73.5	71.0	70.5 70.5	53.0	
g	nond hweet pron	our medwood D							z .	L4	- 9	, ,	Lmin	35.8 40.4	37.7	39.0	41.1	39.8		41.1	39.0 898	40.1	39.4	40.8 30 0	38.6	37.5	38.0	40.4 35 a	35.8	35.8	36.1	37.6	36.9	35.9 27 r	5.75 39,4	39.6	
s Park	it the future s	ential homes (6 .:	57	- 4	+	Гтах	55.2 89.3	82.3	50.3	75.1	67.1		68.4 -0.0	57.7	50.7	56.7	66.6 75 1	6°02	66.3	65.6	76.9	67.9	59.8	61.3 oc c	00.0 76.4	89.3	89.3	80.7 81.2	55.2	
Knox Busines	14 - Located a	existing reside	unadjusted)						с .;	43	- C	1	bəŢ	40.8 61.8	55.9	42.6	47.2	44.6		46.9	42.6	43.1	42.9	45.0	44.6	42.7	43.6	57.9	44.2	40.8	42.1 EE 4	53.2	61.8	60.3	5.8.d 58.4	45.2	
roject Name:		Location:	BA Readings (9': 6'!	72 97		H D	Hour	Min Max	Average	Min	Max	Average		0,	1 0	ım	4	ഗ്	0	~ ∞	6	10	12	13	14	16 16	17	18	17 20	21	
ď			Hourly Leg di	0.08	A) 75.0	(qB	ba	- 22:0 22:0	45.0	H40.0			Time Period	Day	Energy	Night	0	Energy				Night									Day						

đ	roject Name:	Knox Business	Park	9					:Nſ	9349	Energy Av	erage Leq	24-Hour
		15 - Located o	n Old Oleand	ion annave re	-theast of the l	Droiect cite n	an an		Analyst:	A. Wolfe	Day	Night	CNEL
	Location:	existing cell to	wer with elec	trical generat	ors and reside	ntial home.			Date:	3/31- 4/1/2015	63.0	58.2	66.5
Hourly Leg d	BA Readings	(unadjusted)											
50 U	-						Leq (Average)		—L2% (1 Min	ute)	%067 ——	(55 Minutes)	
(A8k) 75.0 0.07													
eq (c	9						8.	9.9		S'9	£.77		
urly l	79	8't	4.88	9.62	5.73	7.62	.29 59	e. <mark>0</mark> 9	9.62	9 3 .0 9	9	8.82	8.2
ю Н 4 40.0 7 0.0 г.с.	°TS	75 75	; S										S I
2	- 0	2 - 3	- - - -	9	- ~	10 - 6	11 12	13 14	15 16	17 18	19 20	21 22	23
	1	1)	H	our Beginning						
Time Period	Hour	ped	Ттах	Lmin	L1%	12%	L5%	%87	L25%	L50%	%061	195%	%667
Дау	Min	57.3 67.2	77.8 05 0	46.2 E0 0	68.5 75 5	65.0 75 5	60.0 75 5	57.0 76 5	53.0 63.0	51.0 50 E	48.0 E2.0	47.5 E2.0	47.0 E1 E
Energy	Average	63.0	88.3	49.0	72.9	70.6	68.5	67.2	58.1	54.7	51.3	50.6	49.7
Night	Min	51.4	73.4	45.5	58.0	55.0	52.5	51.0	50.0	49.0	47.5	47.0	46.5
	Max	62.6	88.7	47.7	72.5	71.0	70.5	68.0	55.5	53.0	50.0	49.5	48.5
Energy	Average	58.2	83.5	46.9	68.5	65.4	62.8	60.3	52.6	50.7	48.5	48.2	47.6
						Hourly	Summary						
	0 -	62.6 51.4	85.1 73 4	47.2 46.5	72.5 58.0	71.0 55 0	70.5 52.5	68.0 51.0	52.5 50.0	50.5 49 0	48.0 47.5	48.0 47 5	47.5 47.0
	7 7	54.8	75.5	46.5	66.5	62.5	57.0	55.5	51.5	49.5	47.5	47.5	47.0
Night	ŝ	52.9	78.5	46.8	60.0	58.5	54.5	52.5	51.5	49.5	48.0	48.0	47.5
	4 v	57.4	7.77 80.9	47.7	68.0	65.5	58.5 61.5	58.0 58.0	52.U 54.5	50.5 52.5	49.0 50.0	48.5 49.5	48.U 48.5
	9	59.6	88.7	47.5	70.5	66.5	61.5	60.0	55.5	53.0	50.0	49.5	48.5
	2	61.2 57.2	85.4 70.7	47.1	73.0	68.0 CF 0	62.0	59.5 57 0	58.5	53.0	49.5	49.0	48.0 47.0
	ര	59.1 59.1	79.7 85.9	40.2 46.7	70.0	0.co 67.0	62.0 62.0	0.06	56.0	52.5	48.0	48.5 48.5	47.U 48.0
	10	59.2	77.8	47.7	68.5	67.0	64.0	62.0	58.5	55.5	51.0	50.0	48.5
	11	63.8 62.3	83.7 85 9	48.9 48.1	73.5 73.5	72.0 69 5	69.0 63 5	67.0 60.0	60.5 55 5	58.5	52.5 50.5	51.5 49.5	50.5 48 5
	13	66.6	95.9	49.4	75.0	73.0	72.0	68.0	58.5	55.0	52.0	51.0	50.5
Day	14	60.3	82.6	49.5	71.5	67.5	62.5	59.5	56.5	54.5	52.5	52.0	51.0
	15 16	62./ 59.6	84.2	50.3	70.5	72.5 69.0	67.5 64.5	63.0 61.5	58.5 56.5	54.0 54.0	51.5	52.0 51.5	50.5
	17	60.8	83.4	50.5	72.0	66.5	62.5	59.5	57.0	54.5	52.5	52.0	51.0
	18	66.5 63.3	94.7	50.8	72.5	72.0 75 5	72.0	72.0 75 5	62.0 50 5	57.0	53.0	52.0	51.5 40.5
	L C	67.5 63.4	1.67	49.U 48.4	0.07 2.87	0.07 ۲۲	C.C/ 0.69	د.د/ ۲۸	ט.שט ק ק ק	0.00	5.0 C	0.UC 7.02	49.0 49.0
	21	58.8	79.2	47.8	71.0	68.0	63.5	59.5 59.5	55.5	53.0	49.5	49.0	48.0
Night	22	60.7	87.8 76.3	45.5	70.0	65.5 64 F	59.5 13 1	55.5 54 5	52.0 54 5	50.0	47.5	47.0 47.5	46.5
	23	ک. ک	/0.3	40.4	b9.U	04.5	c./c	54.5	c.I.c	U.U	48.U	41.5	47.0

F.	Project Name:	Knox Business	Park	1					:NL	9349	Energy Av	erage Leq	24-Hour
		L6 - Located at	t the northwe	st corner of N	larkham Stree	t and Decker	Road near		Analyst:	A. Wolfe	Day	Night	CNEL
	Location:	existing reside	intial homes.						Date:	3/31- 4/1/2015	63.7	60.6	68.2
Hourly Leg d	BA Readings	(unadjusted)											
80.0		-	-	_	_		Leq (Average)			ute)	%067 —	(55 Minutes)	
(A8b) 70:07 0.07 0.07													
ourly Leq (8.72	6.52	2.2 3	C.1 2	t'79	6.19	0.13	8.13	T.43	6'S9	6'59 <i>L</i> '59	S.23	8.1.9
H 40.0 35.0		с С	4 4	9	x x	- C	11	13	15	17	19 20	21 23	23
	н Э)	-	.	,)	ੇ ਸ	our Beginning	- - - -) i		1	2
Time Period	Hour	req	Lmax	Lmin	11%	L2%	L5%	78%	L25%	L50%	%067	195%	%661
Day	Min	60.8 65.0	81.0 90 4	38.2 45 0	72.0 77 5	69.5 74 F	66.0 71.0	63.5 68.0	59.0 64 5	52.0 50 5	43.5 50.0	42.0 40.0	38.5 47 F
Energy	Average	63.7	85.9	42.8	74.8	72.2	68.6	66.1	62.0	55.9	46.9	45.6	43.9
Night	Min	53.2	72.8	41.2	66.0	63.5	56.5	51.0	48.5	46.5	43.0	42.5	41.5
5	Max	64.2 22 2	88.6	45.9	75.5	73.5	69.5 25 2	67.0	63.0 52.0	55.0 55.0	49.0	48.0	47.0
Energy	Average	60.6	83.3	43.6	/1.9	69.3	8.ćð	63.1	58.2	51.3	46.2	45.4	44.5
						- Aunou	A IDITITIO				1		1
	0 4	57.8 53.2	81.5 72.8	43.3 41.2	70.0 66.0	67.5 63.5	62.0 58.0	57.0 52.0	51.0 49.0	48.5 46.5	45.5 43.0	45.0 42.5	44.5 41.5
	5	53.9	77.2	42.2	67.0	64.0	56.5	51.0	48.5	47.0	44.5	43.5	43.0
INIGHT	w 4	5.75 62.2	79.3 88.6	42.5 44.5	69.5 71.0	د./ ه 69.0	64.0 67.0	60.0 64.5	50.5 58.5	46.5 50.5	44.0 46.5	43.5 46.0	43.0 45.5
	S	62.4	82.0	45.9	72.0	70.0	68.0	66.0	63.0	55.0	48.5	47.5	47.0
	91	64.2	83.9	44.6	75.5	73.5	69.5 -0.5	67.0 52.5	62.5	55.0 2	49.0	48.0	46.0
	~ ∞	64.8 62.4	81.0 81.0	45./ 38.2	د.د/ 73.0	71.5	د.0/ 68.0	68.U 66.0	64.U 61.5	57.U 53.5	49.5 44.0	48.5 42.0	47.U 38.5
	б С	61.8 61.0	84.8	38.6	72.5	69.5 71.0	67.0	64.0 54.5	59.5 70.7	52.0	43.5 42.5	42.0 42.5	40.0
	11	6.1.9 8.09	83.7 81.3	40.8 40.6	c.e./ 72.0	0.1.U 69.5	07.0 66.0	64.5 63.5	59.0 59.0	53.0 53.0	43.0 44.0	42.5 42.5	41.5 41.5
	12	61.0	83.7	40.8	72.0	70.0	66.5	64.0	59.5	52.5	44.0	43.0	42.0
Dav	13	61.8 61 4	81.2 01 F	42.3 11 E	73.5	71.0 70 5	67.0 66 5	64.0 64.0	60.5 50 5	54.5 52 0	46.0 44 E	45.0	43.5 43 E
(pp)	15	63.4	82.1	43.2	75.5	72.5	68.5	65.5	61.5	55.0	46.5	45.5	44.0
	16	64.1 2	87.4	44.4	74.5	72.0	68.5 	66.5 2	62.5 22 -	56.5	47.0	46.0	45.0
	17	65.7 65.0	89.6 86 7	42.8 5 2 2	77.0 76 F	74.0	70.0	67.5 68.0	63.5 64 E	58.0 ED E	47.5 40 E	45.5 46.0	43.5 43.5
	19	65.7	86.5	45.9	77.0	74.0	70.5	0.8.0 68.0	04.5 64.5	59.0	50.0	49.0	43.5
	20 21	65.9 67 5	90.4 87.2	44.5 47.8	77.5 73.0	74.5 70.5	70.0 67.5	67.5 65 5	63.0 61.0	57.0 55.0	49.0 48.0	47.5 46.0	46.0 43 5
Aliab+	22	61.0	84.6	44.0	72.0	69.5	67.0	64.5	58.5	52.0	46.0	45.5	44.5
NIGNT	23	61.8	82.9	41.6	75.0	70.5	66.0	62.5	56.0	50.0	45.0	43.5	42.5

4	Project Name:	Knox Business	Park	7		אב רבאבו ו	Measurellie		:NL	9349	Energy Av	erage Leq	24-Hour
	,	l 7 - l ocated al	ong Markhan	n Street near e	visting resider	ntial homes	south of the		Analyst:	A. Wolfe	Day	Night	CNEL
	Location:	Project site.							Date:	3/31- 4/1/2015	69.5	66.3	73.9
Hourly Leg d	BA Readings (unadjusted)											
80.0	-	-	-		-		Leq (Average)			ute)	%067 ——	(55 Minutes)	
(A 8						Ĺ							
(de (de (de) (de)				5				2	۲. ٤.	£.5	<u>Z.</u>	7	
0.09 0.09 DeJ	τ.	T't	9.7ð	69	.89	2.7a	7 [.] 29	E.73	0 ८ 69	۲ <u>۲</u> ۲ <u>۲</u>	0/ [/ [/	69	5.96
20.0 20.0 14	29 79	°9 8.62)
45.0													
1 35.0													
	0 1	2 3	4 5	6 7	8	9 10	11 12	13 14	15 16	17 18	19 20	21 23	23
						H	our Beginning						
Time Period	Hour	ped	Lmax	Lmin	L1%	12%	L5%	%87	L25%	720%	%067	767	%667
Dav	Min	66.0	86.6	40.1	76.5	74.5	72.0	70.0	65.0	54.5	43.0	42.0	41.0
1 marcal	Max	72.1	98.5 02 4	46.7	80.5 70.2	79.0	77.0	75.5	72.0	66.5 c1 7	53.0	50.5	48.0
LILLER	Average	597	92.4 80.4	43.1 41 0	74.0	70.0	610	/3.1 53 ()	68.8 47 5	45 5 45 5	49.2 43 0	47.3 47.5	44.7 41 5
Night	Max	69.5	93.9	45.8	80.0	78.5	76.0	74.0	68.0	58.5	48.0	47.0	46.0
Energy	Average	66.3	88.1	43.2	77.5	75.8	72.7	69.9	62.7	53.4	45.7	44.9	43.8
						Hourly	Summary						
	0	62.1	84.0	43.5	76.0	73.5	67.0	59.0	50.5	48.0	45.5	45.0	44.0
	← (59.7	80.4	41.0	74.0	71.5	64.0	56.5	48.5	45.5	43.0	42.5	41.5
Night	νm	59.8 64.1	83.8 84.0	42.5 42.5	77.0	75.0	71.0	53.U 66.0	c./4 54.5	46.U 47.0	44.0 44.0	44.U 43.5	43.0 43.0
5	4	67.6	93.9	44.2	77.0	76.0	74.0	71.0	62.5	52.5	46.0	45.5	45.0
	ы	67.9	86.1 22 0	45.8	78.5	77.0	74.5	72.5	66.5 20.0	56.5	48.0	47.0	46.0
	1 0	69.5 70.0	87.0	43.0	80.0	78.5	76.0	74.0	68.0 30 r	58.5	47.5	46.5	44.0
	~ ∞	68.7	92.9 87.1	43.1 40.1	6.08 0.97	77.5	75.5	73.5	68.0 68.0	62.U 57.5	49.5 44.5	48.U 43.0	40.U 41.0
	6	67.0	89.8	40.9	77.5	76.0	73.5	71.0	65.0	54.5	44.0	43.0	41.5
	10	67.2 66.0	86.6 °c °	42.7	77.0 76 E	74 E	73.5	71.5	67.0 65.0	58.0 EA E	45.5 44 E	44.5	43.0 41 E
	12	67.4	89.2	40.5	78.5	75.5	72.5	70.5	65.0	55.5	43.0	42.0	41.0
	13	68.2	96.4	41.0	77.0	75.0	73.0	70.5	65.5	56.5	44.0	43.0	42.0
Day	14	67.3 60.7	87.5	42.7 42.5	77.5 80 E	75.5 70 E	73.0	71.0	66.5 60.0	59.0	48.5 51 0	46.5	44.5 4F.0
	19 1	70.3	00.9 03.7	42.8 8.64	0.08	5.07	75.0	73.5	0.60	0.60	0.1.C	49.5	45.0
	17	72.1	98.5	44.7	80.0	78.0	76.0	74.1	71.0	65.5	53.0	50.5	46.5
	18	71.4	87.9	43.0	80.5	79.0	77.0	75.5	72.0	66.5 20 -	53.0	50.5	45.5
	19	/1.2 70.7	8.ce c oo	46./ 15 5	80.U 90 E	۲.8/ ۲.00	2.0/ 3.35	7.4 2.47	د.0/ ۲۵۶	63.5 67 0	0.1.0 10 E	49.5	48.U
	21 21	69.4	00.0 88.1	42.5	00.J	78.0	76.0	73.5	68.0 68.0	02.U 59.5	47.0	40.0 44.5	43.0
Night	22	68.4	90.4	42.5	0.07	77.5	75.0	72.5	64.5	55.0	45.5	44.5	43.5
0	23	66.5	86.5	41.8	78.5	76.5	73.5	69.5	59.5	50.5	45.0	44.0	42.5

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APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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	FH	WA-RD-77-108	HIGHW	AY NO	DISE P	REDICTIC	ON MO	DEL			
Scenar Road Nan Road Segme	io: Existing ne: Harvill Av. nt: s/o Harley	Knox Bl.				Project N Job Nui	lame: mber:	Knox 9349	Business P	ark	
SITE	SPECIFIC I	NPUT DATA				NC	DISE	NODE	L INPUT	s	
Highway Data				S	ite Cor	nditions (I	Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	9,700 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	edium Truc	:ks (2 /	Axles):	15		
Peak H	lour Volume:	970 vehicle	s		He	eavy Truck	is (3+ A	Axles):	15		
Ve	hicle Speed:	50 mph		V	ohiclo	Mix					
Near/Far La	ne Distance:	48 feet		-	Veh	nicleType		Dav	Evenina	Niaht	Daily
Site Data						AL	itos:	77.5%	6 12.9%	9.6%	93.82%
Ba	rrier Heiaht:	0.0 feet			М	ledium Tru	cks:	84.8%	4.9%	10.3%	1.09%
Barrier Type (0-V	/all, 1-Berm):	0.0				Heavy Tru	icks:	86.5%	2.7%	10.8%	5.09%
Centerline Di	st. to Barrier:	100.0 feet		N	oise S	ource Ele	vation	s (in f	eet)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.0	000	,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.	297			
Observer Height	(Above Pad):	5.0 feet			Hear	vy Trucks:	8.	004	Grade Ad	justmen	t: 0.0
P	ad Elevation:	0.0 feet									
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent I	Jistan	ce (in	teet)		
	Road Grade:	0.0%				Autos:	97.	206			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	97.	115			
	Right View:	90.0 degre	es		Hea	vy Trucks:	97.	124			
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresr	nel	Barrier Att	en Be	rm Atten
Autos:	70.20	-2.70		-4.43		-1.20		-4.77	0.0	000	0.000
Medium Trucks:	81.00	-22.07		-4.43		-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	85.38	-15.36		-4.43		-1.20		-5.16	0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrier a	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Da	V L	eq Ev	ening	Leq N	light		Ldn	0	NEL
Autos:	61	.9	60.0		58.2		52.1		60.8	3	61.4
Medium Trucks:	53	3.3	51.8		45.4		43.9)	52.3	3	52.6
Heavy Trucks:	64	1.4	63.0		53.9		55.2	2	63.5	5	63.7
Vehicle Noise:	66	6.5	64.9		59.7		57.1		65.6	6	65.9
Centerline Distan	ce to Noise C	ontour (in fee	t)	-				1			
			ட	70 di	ВA	65 dl	ВА	1	5U dBA	55	o dBA
		-	Lan:	51		109	-		236		508
		C	NEL:	53		115	>		247		532

	FHV	VA-RD-77-108	HIGHV	VAY N	OISE PI	REDICTIC		JEL			
Scenari	o: Existing					Project I	Vame: F	(nox B	lusiness P	ark	
Road Nam	e: Harvill Av.					Job Nu	mber: 9	9349			
Road Segmer	nt: n/o Oleande	er Av.									
SITE	SPECIFIC IN	PUT DATA				N	DISE N	IODE	L INPUT	s	
Highway Data				S	Site Con	ditions (Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	9,100 vehicle	es				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium True	cks (2 A	xles):	15		
Peak H	our Volume:	910 vehicle	6		He	avy Truck	ks (3+ A	xles):	15		
Vei	hicle Speed:	50 mph		V	/ehicle	Mix					
Near/Far Lai	ne Distance:	48 feet			Veh	icleType	1	Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	93.82
Bar	rier Height:	0.0 feet			Me	edium Tru	icks:	34.8%	4.9%	10.3%	1.099
Barrier Type (0-W	all, 1-Berm):	0.0			F	leavy Tru	icks:	86.5%	2.7%	10.8%	5.09%
Centerline Dis	t. to Barrier:	100.0 feet			loiso Se	urco Ela	vation	(in fo	(of)		
Centerline Dist.	to Observer:	100.0 feet		-	10/36 30				el)		
Barrier Distance	to Observer:	0.0 feet			Modiu	n Trucks	22	97			
Observer Height (Above Pad):	5.0 feet			Heav	v Trucks	8.0	04	Grade Ad	iustment	0.0
Pa	d Elevation:	0.0 feet			mour	<i>y 1100.</i>	0.0			,	
Roa	ad Elevation:	0.0 feet		L	ane Eq.	uivalent	Distanc	e (in f	eet)		
F	Road Grade:	0.0%				Autos:	97.2	206			
	Left View:	-90.0 degree	es		Mediui	m Trucks:	97.1	15			
	Right View:	90.0 degree	es		Heav	y Trucks:	97.1	24			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el .	Barrier Att	en Ber	m Atter
Autos:	70.20	-2.98		-4.43	3	-1.20		4.77	0.0	000	0.00
Medium Trucks:	81.00	-22.35		-4.43	5	-1.20		4.88	0.0	000	0.00
Heavy Trucks:	85.38	-15.64		-4.43	5	-1.20		-5.16	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Hou	r Leq Day	· 1	Leq Ev	rening	Leq N	light		Ldn	C	NEL
Autos:	61.	.6	59.7		57.9		51.9		60.	5	61.
Medium Trucks:	53.	.0	51.5		45.2		43.6		52.1	1	52.
Heavy Trucks:	64.	.1	62.7		53.7		54.9		63.3	3	63.
Vehicle Noise:	66	.3	64.7		59.5		56.9		65.3	3	65.
Centerline Distance	e to Noise Co	ontour (in feet)	70 -	0.4	05.4	04		0 -10 4		-10.4
				70 d	BA	65 d	БA	6	U dBA	55	aBA
			Lan:	49	9	10	C		220	4	87
		~ ~		E 4			0				7//

Monday, June 08, 2015

	FHW	/A-RD-77-108 H	IIGHWA	NOISE I	PREDICT		EL			
Scenari	o: Existing				Project	Name: K	inox B	usiness Pa	ark	
Road Nam	e: Harvill Av.				Job N	lumber: 9	349			
Road Segmer	nt: s/o Oleande	er Av.								
SITE	SPECIFIC IN	PUT DATA			1	IOISE M	ODEI		s	
Highway Data				Site Co	onditions	(Hard = 1)	10, So	ft = 15)		
Average Daily	Traffic (Adt):	8,800 vehicles				A	utos:	15		
Peak Hour	Percentage:	10%		N	ledium Tr	ucks (2 A)	xles):	15		
Peak H	our Volume:	880 vehicles		H	leavy Tru	cks (3+ A)	xles):	15		
Vei	hicle Speed:	50 mph		Vehicle	Mix					
Near/Far Lai	ne Distance:	48 feet		Venicie	hicleType	e [Dav	Evenina	Niaht	Dailv
Site Data						Autos: 7	7.5%	12.9%	9.6%	93.82%
Rar	rier Height	0.0 feet		1	Aedium T	rucks: 8	84.8%	4.9%	10.3%	1.09%
Barrier Type (0-W	all, 1-Berm):	0.0			Heavy T	rucks: 8	86.5%	2.7%	10.8%	5.09%
Centerline Dis	st. to Barrier:	100.0 feet		Noise	Source E	levations	(in fe	et)		
Centerline Dist.	to Observer:	100.0 feet			Auto	e· 0.0	00	/		
Barrier Distance	to Observer:	0.0 feet		Medi	um Truck	s. 0.0	97			
Observer Height (J	Above Pad):	5.0 feet		Hei	ann Truck	s: 8.0	04	Grade Adi	iustmen	t: 0.0
Pa	ad Elevation:	0.0 feet		1100	ivy much	3. 0.0	04	,		
Roa	ad Elevation:	0.0 feet		Lane E	quivalen	t Distance	e (in f	eet)		
F	Road Grade:	0.0%			Auto	s: 97.2	06			
	Left View:	-90.0 degrees		Medi	um Truck	s: 97.1	15			
	Right View:	90.0 degrees		Hea	avy Truck	s: 97.1	24			
FHWA Noise Mode	el Calculations	3		1						
VehicleType	REMEL	Traffic Flow	Distance	ə Finit	e Road	Fresne	el l	Barrier Atte	en Be	rm Atten
Autos:	70.20	-3.13	-4	.43	-1.20	-	4.77	0.0	000	0.000
Medium Trucks:	81.00	-22.50	-4	.43	-1.20	-	4.88	0.0	000	0.000
Heavy Trucks:	85.38	-15.78	-4	.43	-1.20	-	5.16	0.0	000	0.000
Unmitigated Noise	e Levels (witho	out Topo and b	arrier att	enuation)					-
VehicleType	Leq Peak Hou	r Leq Day	Leq	Evening	Leq	Night		Ldn	С	NEL
Autos:	61.	4 59	9.5	57.	8	51.7		60.3	3	61.0
Medium Trucks:	52.	9 5	1.4	45.	0	43.5		51.9	9	52.2
Heavy Trucks:	64.	0 62	2.5	53.	5	54.8		63.1		63.2
Vehicle Noise:	66.	1 64	4.5	59.	3	56.7		65.2	2	65.5
Centerline Distand	ce to Noise Co	ntour (in feet)			-					
			7	0 dBA	65	dBA	6	0 dBA	55	i dBA
		Le	dn:	48	1	03		221	4	476
		CN	=L:	50	1	07		231	4	198

	FH	WA-RD-77-108	HIGHW	AY NO	DISE PI	REDICTIO	N MO	DEL			
Scenari	o: Existing					Project N	lame: I	Knox	Business P	ark	
Road Nam	e: I-215 SB F	wy				Job Nu	mber: 9	9349			
Road Segmen	nt: n/o Harley	Knox Bl.									
SITE S	SPECIFIC II	NPUT DATA				NC	DISE N	IODE	L INPUT	S	
Highway Data				S	ite Con	ditions (F	lard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	38,600 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	:ks (2 A	Axles).	15		
Peak H	our Volume:	3,860 vehicle	s		He	avy Truck	rs (3+ A	Axles).	15		
Vel	hicle Speed:	65 mph		v	ehicle	Mix					
Near/Far Lar	ne Distance:	60 feet		-	Veh	icleType		Day	Evening	Night	Daily
Site Data						Au	itos:	77.5%	6 12.9%	9.6%	93.82%
Bar	rier Heiaht:	0.0 feet			M	edium Tru	cks:	84.8%	6 4.9%	10.3%	1.09%
Barrier Type (0-W	all, 1-Berm):	0.0			1	Heavy Tru	cks:	86.5%	6 2.7%	10.8%	5.09%
Centerline Dis	st. to Barrier:	100.0 feet		N	loise So	ource Ele	vation	s (in f	eet)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.0	000			
Barrier Distance t	to Observer:	0.0 feet			Mediu	m Trucks:	2.2	297			
Observer Height (Above Pad):	5.0 feet			Heav	v Trucks:	8.0	004	Grade Ad	ljustmen	t: 0.0
Pa	d Elevation:	0.0 feet		-							
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalent L	Distand	ce (in	feet)		
F	Road Grade:	0.0%				Autos:	95.	525			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.4	432			
	Right View:	90.0 degre	es		Heav	ry Trucks:	95.4	441			
FHWA Noise Mode	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresn	iel	Barrier Att	ten Be	rm Atten
Autos:	74.55	2.15		-4.32		-1.20		-4.77	0.0	000	0.000
Medium Trucks:	84.86	-17.21		-4.31		-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	88.18	-10.50		-4.31		-1.20		-5.16	0.0	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrier a	attenı	ation)						
VehicleType	Leq Peak Ho	ur Leq Day	/ L	eq Ev	ening	Leq N	ïght		Ldn	C	NEL
Autos:	71	.2	69.3		67.5		61.5		70.1	1	70.7
Medium Trucks:	62	2.1	60.6		54.3		52.7		61.3	2	61.4
Heavy Trucks:	72	2.2	70.7		61.7		63.0)	71.3	3	71.4
Vehicle Noise:	74	1.9	73.3		68.7		65.5	, ,	74.0	0	74.3
Centerline Distance	e to Noise C	ontour (in fee)								
				70 di	BA	65 dl	BA		60 dBA	55	5 dBA
		~	Ldn:	184	1	397	r		856	1	,844
		C	NEL:	194	1	418	5		901	1	,940

Monday, June 08, 2015

	FH	WA-RD-77	-108 HIG	HWAY	NOISE	PRE	DICTIC	ON MOI	DEL			
Scenar Road Nan Road Segme	rio: Existing ne: I-215 SB F nt: s/o Harley	wy Knox Bl.				P	roject N Job Nu	lame: I mber: S	Knox 9349	Business Pi	ark	
SITE	SPECIFIC II	NPUT DA	ТА				NC	DISE N	IODE	EL INPUTS	5	
Highway Data					Site C	ondi	tions (l	Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	34,500 ve	hicles						Autos	: 15		
Peak Hour	Percentage:	10%			1	Mediu	ım Truc	:ks (2 A	(xles)	: 15		
Peak H	lour Volume:	3,450 veł	nicles			Heav	y Truck	is (3+ A	(xles)	: 15		
Ve	hicle Speed:	65 mp	h		Vehic	le Mi	<i>,</i>					
Near/Far La	ne Distance:	60 fee	et 🛛		V	ehicle	eTvpe		Dav	Evenina	Niaht	Dailv
Site Data							AL	itos:	77.5%	6 12.9%	9.69	6 93.82%
Ba	rrier Heiaht:	0.0 fe	et			Medi	um Tru	cks:	84.8%	6 4.9%	10.39	6 1.09%
Barrier Type (0-W	Vall, 1-Berm):	0.0				He	avy Tru	icks:	86.5%	6 2.7%	10.89	6 5.09%
Centerline Di	ist. to Barrier:	100.0 fe	et		Noise	Sou	ce Ele	vation	s (in i	feet)		
Centerline Dist.	to Observer:	100.0 fe	et				Autos:	0.0	000			
Barrier Distance	to Observer:	0.0 fe	et		Med	dium	Trucks:	2.2	97			
Observer Height	(Above Pad):	5.0 fe	et		He	avv	Trucks:	8.0	004	Grade Adj	ustmer	nt: 0.0
P	ad Elevation:	0.0 fe	et									
Ro	ad Elevation:	0.0 fe	et		Lane	Equiv	alent	Distand	ce (in	feet)		
	Road Grade:	0.0%					Autos:	95.5	525			
	Left View:	-90.0 de	egrees		Med	dium	I rucks:	95.4	132			
	Right View:	90.0 de	egrees		He	eavy	l rucks:	95.4	141			
FHWA Noise Mod	lel Calculation	าร										
VehicleType	REMEL	Traffic Fl	ow D	istance	Fin	ite Ro	bad	Fresn	el	Barrier Atte	en Be	erm Atten
Autos:	74.55	i 1	1.67	-4.	32	-	1.20		-4.77	0.0	00	0.000
Medium Trucks:	84.86	i -17	7.70	-4.	31	-	1.20		-4.88	0.0	00	0.000
Heavy Trucks:	88.18	-10).99	-4.	31	-	1.20		-5.16	0.0	00	0.000
Unmitigated Nois	e Levels (with	nout Topo	and barr	ier atte	enuatio	n)						
VehicleType	Leq Peak Ho	ur Leq	Day	Leq	Evening	7	Leq N	light		Ldn	(CNEL
Autos:	70	0.7	68.8		67	7.0		61.0		69.6	6	70.2
Medium Trucks:	61	1.6	60.1		53	3.8		52.2		60.7	,	60.9
Heavy Trucks:	7'	1.7	70.3		61	1.2		62.5		70.8		71.0
venicie ivoise:	14	4.5	72.8		66	5.Z		65.0		73.5)	73.8
Centerline Distan	ce to Noise C	ontour (in	feet)	70	APA		65 d	DA.		60 dBA	5	5 dPA
			I dn		171		360	2/1	I	70/		1 711
			CNEL ·		180		389	2		836		1,7 11
			GIVEL.		100		300	,		000		,001

	FHV	VA-RD-77-106	HIGH	IWATN	IOISE PR	EDICTI		JEL			
Scenario	: Existing					Project	Name: H	(nox E	Business P	ark	
Road Name	e: I-215 NB F	NУ				Job Ni	imber: 9	9349			
Road Segmen	t: n/o Harley I	Knox Bl.									
SITE S	PECIFIC IN	PUT DATA				N	OISE N	IODE	L INPUT	5	
Highway Data					Site Con	ditions (Hard =	10, Sc	oft = 15)		
Average Daily T	raffic (Adt):	32,500 vehicle	es				/	Autos:	15		
Peak Hour F	Percentage:	10%			Mee	dium Tru	cks (2 A	xles):	15		
Peak Ho	our Volume:	3,250 vehicle	s		Hea	avy Truc	ks (3+ A	xles):	15		
Veh	icle Speed:	65 mph			Vehicle I	/ix					
Near/Far Lan	e Distance:	60 feet		F	Vehi	cleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	93.82
Barr	ier Height:	0.0 feet			Me	edium Tr	ucks:	84.8%	4.9%	10.3%	1.099
Barrier Type (0-Wa	all, 1-Berm):	0.0			H	leavy Tr	ucks:	86.5%	2.7%	10.8%	5.09%
Centerline Dist	t. to Barrier:	100.0 feet		1	Noise So	urce Ele	evations	; (in fe	et)		
Centerline Dist. to	o Observer:	100.0 feet		-		Autos	. 0.0	100	.,		
Barrier Distance to	o Observer:	0.0 feet			Mediur	n Trucks	: 2.2	97			
Observer Height (A	lbove Pad):	5.0 feet			Heav	v Trucks	: 8.0	04	Grade Ad	ustment	: 0.0
Pa	d Elevation:	0.0 feet		_							
Road	d Elevation:	0.0 feet		1	Lane Equ	uivalent	Distand	e (in i	feet)		
R	oad Grade:	0.0%				Autos	: 95.8	525			
	Left View:	-90.0 degre	es		Mediur	n Trucks	: 95.4	32			
	Right View:	90.0 degre	es		Heav	y Trucks	: 95.4	41			
FHWA Noise Mode	I Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atter
Autos:	74.55	1.41		-4.3	2	-1.20		4.77	0.0	000	0.00
Medium Trucks:	84.86	-17.96		-4.3	1	-1.20		4.88	0.0	000	0.00
Heavy Trucks:	88.18	-11.25		-4.3	1	-1.20		5.16	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er atten	uation)						
VehicleType I	Leq Peak Hou	r Leq Day	/	Leq E	vening	Leq I	light		Ldn	C	NEL
Autos:	70	.4	68.5		66.8		60.7		69.3	3	69.
Medium Trucks:	61	.4	59.9		53.5		52.0		60.4	ŀ	60
Heavy Trucks:	71	.4	70.0		61.0		62.2		70.6	6	70.
Vehicle Noise:	74	.2	72.6		67.9		64.8		73.2	2	73.
Centerline Distance	e to Noise Co	ontour (in feet)	-							(0.1
			L	70 0	авА	65 0	IBA	6	U dBA	55	aBA
			Lan:	16	54 70	35	4		763	1,	644
		C	VEL:	17	C3	37	3		803	1.	730

	FH	WA-RD-77-10	B HIGH	IWAY N	IOISE PF	REDICTIC	ON MOI	DEL			
Scenar Road Narr Road Segme	io: Existing ne: I-215 NB F nt: s/o Harley	wy Knox Bl.				Project N Job Nui	lame: H mber: S	(nox B 349	usiness Pa	ark	
SITE	SPECIFIC IN	NPUT DATA				NC	DISE N	ODE	L INPUTS	3	
Highway Data				:	Site Con	ditions (I	Hard =	10, So	ft = 15)		
Average Daily Peak Hour Peak H	Traffic (Adt): Percentage: Iour Volume:	27,800 vehic 10% 2,780 vehicle	les es		Me He	dium Truc avy Truck	4 ks (2 A s (3+ A	utos: xles): xles):	15 15 15		
Ve	hicle Speed:	65 mph		1	Vehicle I	Mix					
Near/Far La	ne Distance:	60 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						AL	itos:	7.5%	12.9%	9.6%	93.82%
Ba	rrier Heiaht:	0.0 feet			Me	edium Tru	cks: 8	34.8%	4.9%	10.3%	1.09%
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Tru	icks: 1	36.5%	2.7%	10.8%	5.09%
Centerline Di	st. to Barrier:	100.0 feet		1	Noise So	ource Ele	vations	(in fe	et)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.0	00			
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks:	2.2	97			
Observer Height (Above Pad):	5.0 feet			Heav	y Trucks:	8.0	04	Grade Adj	ustment	: 0.0
Po	ad Elevation:	0.0 feet			ane Fr	uivalent l	Distanc	e (in f	eet)		
7.0	Road Grade:	0.0 1661		-	Lano Lq	Autos:	95.5	25	000		
	Left View:	0.0 %	00		Mediu	n Trucks:	95.4	32			
	Right View:	90.0 degre	es		Heav	y Trucks:	95.4	41			
FHWA Noise Mod	el Calculatior	ıs									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresn	e/ I	Barrier Atte	en Bei	rm Atten
Autos:	74.55	0.73		-4.32	2	-1.20		4.77	0.0	00	0.000
Medium Trucks:	84.86	-18.64		-4.31	1	-1.20	-	4.88	0.0	00	0.000
Heavy Trucks:	88.18	-11.93		-4.31	1	-1.20		5.16	0.0	00	0.000
Unmitigated Nois	e Levels (with	nout Topo and	barrie	er atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	y	Leq Ev	vening	Leq N	light		Ldn	С	NEL
Autos:	69	9.8	67.9		66.1		60.0		68.7		69.3
Medium Trucks:	60	0.7	59.2		52.8		51.3		59.8		60.0
Heavy Trucks:	70).7	69.3		60.3		61.5		69.9		70.0
Vehicle Noise:	73	3.5	71.9		67.3		64.1	_	72.6		72.9
Centerline Distan	ce to Noise C	ontour (in fee	t)				-				
				70 c	/BA	65 dl	BA	6	0 dBA	55	dBA
			Ldn:	14	18	319	9		688	1,	481
		C	NEL:	15	56	336	6		724	1,	559

	FH\	NA-RD-77-108	BHIGHW	AY NO	OISE PF	REDICTIO	N MODEL			i i		
Scenar Road Narr Road Segme	io: Existing ne: Harley Kno nt: e/o Harvill	ix Bl. Av.				Project N Job Nur	lame: Kno: nber: 9349	x Business P	ark			
SITE	SPECIFIC IN	IPUT DATA				NO	ISE MOD	EL INPUT	S			
Highway Data				S	ite Con	ditions (H	lard = 10,	Soft = 15)				
Average Daily	Traffic (Adt):	9,900 vehicl	es				Auto	s: 15				
Peak Hour	Percentage:	10%			Mee	dium Truc	ks (2 Axles	s): 15				
Peak H	lour Volume:	990 vehicle	s		Hea	avy Truck	s (3+ Axles	s): 15				
Ve	hicle Speed:	45 mph		v	ehicle I	Mix						
Near/Far La	ne Distance:	54 feet		-	Vehi	icleType	Day	Evening	Night	Daily		
Site Data						Au	tos: 77.5	5% 12.9%	9.6%	93.82%		
Ba	rrier Height:	0.0 feet			Me	edium Tru	cks: 84.8	4.9%	10.3%	1.09%		
Barrier Type (0-W	/all, 1-Berm):	0.0			F	leavy Tru	cks: 86.5	5% 2.7%	10.8%	5.09%		
Centerline Di	st. to Barrier:	100.0 feet			laise Sa	urco Elos	vations (in	foot)				
Centerline Dist.	to Observer:	100.0 feet			0.00 00	Autos	0.000	1000)				
Barrier Distance	to Observer:	0.0 feet			Modiur	n Trucks	2 297					
Observer Height	(Above Pad):	5.0 feet			Hoav	v Trucke	8 004	Grade Ad	iustment	0.0		
P	ad Elevation:	0.0 feet			neav	y mucho.	0.004					
Ro	ad Elevation:	0.0 feet		L	ane Equ	uivalent L	Distance (i	n feet)				
	Road Grade:	0.0%				Autos:	96.416					
	Left View:	-90.0 degre	es		Mediur	n Trucks:	96.324					
	Right View:	90.0 degre	es		Heav	y Trucks:	96.333					
FHWA Noise Mod	el Calculation	s										
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresnel	Barrier Att	en Ber	m Atten		
Autos:	68.46	-2.16		-4.38		-1.20	-4.7	7 0.0	000	0.000		
Medium Trucks:	79.45	-21.53		-4.37		-1.20	-4.8	8 0.0	000	0.000		
Heavy Trucks:	84.25	-14.81		-4.38		-1.20	-5.1	6 0.0	000	0.000		
Unmitigated Nois	e Levels (with	out Topo and	barrier a	attenu	uation)							
VehicleType	Leq Peak Ho	ur Leq Daj	V L	eq Ev	ening	Leq N	ight	Ldn	CI	VEL		
Autos:	60).7	58.8		57.1		51.0	59.6	6	60.2		
Medium Trucks:	52	2.3	50.8		44.5		42.9	51.4	1	51.6		
Heavy Trucks:	63	8.9	62.4		53.4		54.7	63.0)	63.1		
Vehicle Noise:	65	5.8	64.2		58.8		56.4	64.9	9	65.1		
Centerline Distan	ce to Noise C	ontour (in fee	t)							-		
				70 d	BA	65 dE	BA	60 dBA	55	dBA		
			Ldn:	45 98 211			4	54				
	CNEL:						47 102 220 474					

Monday, June 08, 2015

Monday, June 08, 2015

Monday, June 08, 2015

	FH	WA-RD-77-10	8 HIGH	WAY N	OISE PI	REDICTIC	N MODE	iL.			
Scenai Road Nan Road Segme	rio: Existing ne: Harley Kno nt: e/o I-215 S	ox Bl. 3B Fwy Ramps				Project N Job Nui	lame: Kn mber: 93	ox Business 49	Park		
SITE	SPECIFIC II	NPUT DATA				NC	DISE MO	DEL INPU	тs		
Highway Data				5	Site Cor	ditions (I	Hard = 10), Soft = 15)			
Average Daily	Traffic (Adt):	12,200 vehic	les				Au	tos: 15			
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Axl	es): 15			
Peak H	lour Volume:	1,220 vehicle	es		He	avy Truck	's (3+ Axl	es): 15			
Ve	hicle Speed:	45 mph		1	Vehicle	Mix					
Near/Far La	ne Distance:	54 feet		-	Veh	icleType	Da	ay Evening	a Ni	ght	Daily
Site Data						AL	itos: 77	.5% 12.9%	6 9	9.6%	93.82%
Ba	rrier Heiaht:	0.0 feet			М	edium Tru	cks: 84	.8% 4.9%	6 10	0.3%	1.09%
Barrier Type (0-V	Vall, 1-Berm):	0.0			I	Heavy Tru	cks: 86	.5% 2.7%	6 1	0.8%	5.09%
Centerline Di	ist. to Barrier:	100.0 feet			Voise Se	ource Ele	vations (in feet)			
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.00)			-
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.29	7			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.00	4 Grade A	Adjust	ment:	0.0
P	ad Elevation:	0.0 feet		L		,					
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent l	Distance	(in feet)			
	Road Grade:	0.0%				Autos:	96.41	6			
	Left View:	-90.0 degre	ees		Mediu	m Trucks:	96.32	4			
	Right View:	90.0 degre	ees		Heav	y Trucks:	96.33	3			
FHWA Noise Mod	lel Calculatior	ıs									
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite	Road	Fresnel	Barrier A	Atten	Berr	n Atten
Autos:	68.46	-1.25	5	-4.38	3	-1.20	-4	.77 (0.000		0.000
Medium Trucks:	79.45	-20.62	2	-4.37	7	-1.20	-4	.88 (0.000		0.000
Heavy Trucks:	84.25	-13.91		-4.38	3	-1.20	-5	.16 (0.000		0.000
Unmitigated Nois	e Levels (with	out Topo and	l barrie	r atten	uation)						-
VehicleType	Leq Peak Ho	ur Leq Da	y	Leq Ev	/ening	Leq N	ight	Ldn		CN	IEL
Autos:	61	1.6	59.7		58.0		51.9	60	0.5		61.1
Medium Trucks:	53	3.3	51.7		45.4		43.8	52	2.3		52.5
Heavy Trucks:	64	1.8	63.4		54.3		55.6	63	3.9		64.0
Vehicle Noise:	66	6.7	65.1		59.7		57.3	6	5.8		66.0
Centerline Distan	ce to Noise C	ontour (in fee	t)								-
			L	70 a	1BA	65 dl	BA	60 dBA		55 0	зВА
			Ldn:	52	2	112	2	242		52	21
	CNEL:				54 117 253 544					4	

	FH	WA-RD-77-10	8 HIGH	HWAY N	IOISE PR	EDICTIC	ON MOI	DEL			
Scenari	io: Existing					Project N	lame: H	<nox e<="" th=""><th>Business P</th><th>ark</th><th></th></nox>	Business P	ark	
Road Nam	e: Harley Kno	x Bl.				Job Nu	mber: §	9349			
Road Segmer	nt: e/o I-215 N	IB Fwy Ramps	5								
SITE	SPECIFIC II	NPUT DATA				NC	DISE N	IODE	L INPUT	S	
Highway Data				4	Site Con	ditions (l	Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	15,600 vehic	les				/	Autos:	15		
Peak Hour	Percentage:	10%			Med	dium Truc	:ks (2 A	xles):	15		
Peak H	our Volume:	1,560 vehicle	es		Hea	avy Truck	is (3+ A	xles):	15		
Ve	hicle Speed:	45 mph		1	Vehicle N	lix					
Near/Far La	ne Distance:	54 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						AL	itos:	77.5%	12.9%	9.6%	93.82
Bai	rier Height:	0.0 feet			Me	dium Tru	cks:	84.8%	4.9%	10.3%	1.099
Barrier Type (0-W	all, 1-Berm):	0.0			h	leavy Tru	cks:	86.5%	2.7%	10.8%	5.099
Centerline Dis	st. to Barrier:	100.0 feet			Noise So	urce Ele	vations	s (in fe	et)		
Centerline Dist.	to Observer:	100.0 feet		-		Autos:	0.0	000			
Barrier Distance	to Observer:	0.0 feet			Mediun	n Trucks:	2.2	97			
Observer Height (Above Pad):	5.0 feet			Heav	v Trucks:	8.0	004	Grade Ad	liustment	: 0.0
Pa	ad Elevation:	0.0 feet		L		,	-				
Roa	ad Elevation:	0.0 feet		1	Lane Equ	ivalent l	Distand	e (in t	feet)		
1	Road Grade:	0.0%				Autos:	96.4	116			
	Left View:	-90.0 degre	ees		Mediun	n Trucks:	96.3	324			
	Right View:	90.0 degre	es		Heav	y Trucks:	96.3	333			
FHWA Noise Mode	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresn	el	Barrier Att	ten Ber	m Atter
Autos:	68.46	-0.18	3	-4.38	3	-1.20		-4.77	0.0	000	0.00
Medium Trucks:	79.45	-19.55	5	-4.3	7	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	84.25	-12.84	1	-4.38	3	-1.20		-5.16	0.0	000	0.00
Unmitigated Noise	e Levels (with	nout Topo and	l barri	ier atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	y I	Leq E	/ening	Leq N	ight		Ldn	C	NEL
Autos:	62	2.7	60.8		59.0		53.0		61.6	6	62
Medium Trucks:	54	1.3	52.8		46.5		44.9		53.4	4	53.
Heavy Trucks:	65	o.8	64.4		55.4		56.6		65.0	υ	65.
Vehicle Noise:	67	7.8	66.2		60.8		58.4		66.8	В	67.
Centerline Distant	ce to Noise C	ontour (in fee	et)	70 /	ND A	65 d	DA.	6	OdPA	55	dPA
			I dn'	,00	1	133	1)	6	285	50	31/1
			NEL	6	4	104	-		200	6	×11
				0			-				

	FH	WA-RD-77-108	HIGHW	AY NO	ISE PI	REDICTIO	N MODE	EL			
Scenario Road Name Road Segmen	o: Existing e: Oleander / nt: e/o Drivew	Av. ay 6				Project N Job Nur	ame: Kr nber: 93	ox Business 49	Park		
SITE S	SPECIFIC II	NPUT DATA				NO	ISE MO	DEL INPU	TS		
Highway Data				Si	te Cor	ditions (H	lard = 10), Soft = 15)			
Average Daily	Traffic (Adt):	100 vehic	es				AL	tos: 15			
Peak Hour I	Percentage:	10%			Me	dium Truc	ks (2 Ax	les): 15			
Peak Ho	our Volume:	10 vehicle	s		He	avy Truck	s (3+ Ax	les): 15			
Vel	nicle Speed:	40 mph		Ve	hicle	Mix					
Near/Far Lar	ne Distance:	36 feet			Veh	icleTvpe	D	av Evening	a Nie	aht	Dailv
Site Data						Au	tos: 77	.5% 12.9%	6 9	9.6%	93.82%
Bar	rier Heiaht:	0.0 feet			М	edium Tru	cks: 84	4.9%	6 10).3%	1.09%
Barrier Type (0-Wa	all, 1-Berm):	0.0			1	Heavy Tru	cks: 86	6.5% 2.7%	6 10).8%	5.09%
Centerline Dis	t. to Barrier:	100.0 feet		No	oise So	ource Elev	ations	(in feet)			
Centerline Dist. t	o Observer:	100.0 feet				Autos	0.00	0			
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Trucks:	2.29	7			
Observer Height (/	Above Pad):	5.0 feet			Heav	v Trucks:	8.00	4 Grade A	ldjustr	nent:	0.0
Pa	Pad Elevation: 0.0 feet										
Roa	d Elevation:	0.0 feet		Lá	ine Eq	uivalent L	vistance	(in feet)			
F	Road Grade:	0.0%				Autos:	98.49	4			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	98.40	4			
	Right View:	90.0 degre	es		Heav	ly Trucks:	98.41	3			
FHWA Noise Mode	el Calculation	ıs									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresnel	Barrier A	Atten	Berm	Atten
Autos:	66.51	-21.60		-4.52		-1.20	-4	.77 (0.000		0.000
Medium Trucks:	77.72	-40.97		-4.51		-1.20	-4	.88 (0.000		0.000
Heavy Trucks:	82.99	-34.26		-4.51		-1.20	-5	.16 (0.000		0.000
Unmitigated Noise	Levels (with	nout Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Da	/ L	eq Eve	ning	Leq Ni	ight	Ldn		CN	EL
Autos:	39	9.2	37.3		35.5		29.5	38	3.1		38.7
Medium Trucks:	31	1.0	29.5		23.2		21.6	30	0.1		30.3
Heavy Irucks:	43	3.0	41.6		32.6		33.8	42	2.2		42.3
venicle Noise:	44	+./	43.2		37.5		35.4	43	5.8		44.1
Centerline Distance	e to Noise C	ontour (in fee)								
			L	70 dE	8A	65 dE	ЗA	60 dBA		55 d	BA
		0	Ldn:	2 4 8		18	5				
	CNEL:					2 4 9 19					,

	FH\	NA-RD-77-108	HIGHW	AY N	OISE PF	REDICTIC	N MOI	DEL			
Scenar	rio: Existing					Project N	lame: H	Knox E	Business P	ark	
Road Nan	ne: Oleander A	w.				Job Nur	nber: §	9349			
Road Segme	nt: w/o Harvill	Av.									
SITE	SPECIFIC IN	IPUT DATA				NC	ISE N	IODE		s	
Highway Data				S	Site Con	ditions (H	lard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	500 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A	xles):	15		
Peak H	lour Volume:	50 vehicle	s		He	avy Truck	s (3+ A	xles):	15		
Ve	ehicle Speed:	40 mph		v	ehicle l	Nix					
Near/Far La	ane Distance:	36 feet		F	Veh	icleType		Day	Evening	Night	Daily
Site Data						Au	tos:	, 77.5%	12.9%	9.6%	93.82%
Ba	rrier Height	0.0 feet			Me	edium Tru	cks:	84.8%	4.9%	10.3%	1.09%
Barrier Type (0-V	Vall, 1-Berm):	0.0			ŀ	łeavy Tru	cks:	86.5%	2.7%	10.8%	5.09%
Centerline D	ist. to Barrier:	100.0 feet		٨	loise Sc	ource Ele	vations	s (in fe	et)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.0	000	,		
Barrier Distance	to Observer:	0.0 feet			Mediur	n Trucks:	2.2	297			
Observer Height	(Above Pad):	5.0 feet	Heavy Trucks: 8.004 Grade Adjustment:							t: 0.0	
P	Pad Elevation: 0.0 feet										
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent L	Jistand	e (in i	reet)		
	Road Grade:	0.0%				Autos:	98.4	194			
	Left View:	-90.0 degre	es		Mediur	n Trucks:	98.4	104			
	Right View:	90.0 degre	es		Heav	y Trucks:	98.4	113			
FHWA Noise Mod	lel Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresn	el	Barrier Att	en Be	rm Atten
Autos:	66.51	-14.61		-4.52		-1.20		-4.77	0.0	000	0.000
Medium Trucks:	77.72	-33.98		-4.51		-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	82.99	-27.27		-4.51		-1.20		-5.16	0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	/ L	.eq Ev	ening	Leq N	ight		Ldn	С	NEL
Autos:	46	5.2	44.3		42.5		36.5		45.1	I	45.7
Medium Trucks:	38	3.0	36.5		30.2		28.6		37.1	I	37.3
Heavy Trucks:	50	0.0	48.6		39.6		40.8		49.2	2	49.3
Vehicle Noise:	51	.7	50.2		44.5		42.4		50.8	3	51.0
Centerline Distan	ce to Noise C	ontour (in fee	t)								
				70 d	BA	65 dł	BA	6	i0 dBA	55	i dBA
			Ldn:	5		11			24		52
	CNEL:					5 12 25 55					

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	FH	WA-RD-77-10	BHIGHW	AY NC	DISE PI	REDICTIO	N MOD	EL			
Scenar Road Nan Road Segme	io: Existing Pl ne: Harvill Av. nt: s/o Harley	lus Project Knox Bl.		Project Name: Knox Business Park Job Number: 9349							
SITE	SPECIFIC II	NPUT DATA				NC	ISE M	ODEL	INPUTS	3	
Highway Data				S	ite Cor	nditions (H	lard = 1	10, Sof	t = 15)		
Average Daily	Traffic (Adt):	11,513 vehic	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A)	des):	15		
Peak H	lour Volume:	1,151 vehicle	es		He	avy Truck	s (3+ A)	des):	15		
Ve	hicle Speed:	50 mph		V	ohiclo	Mix					
Near/Far La	ne Distance:	48 feet			Veh	nicleType	1)av	Evenina	Niaht	Daily
Site Data					1011	Au	tos: 7	7.5%	12.9%	9.6%	88.14%
Ba	rrier Height	0.0 feet			М	edium Tru	cks: 8	4.8%	4.9%	10.3%	2.37%
Barrier Type (0-W	/all, 1-Berm):	0.0			I	Heavy Tru	cks: 8	6.5%	2.7%	10.8%	9.48%
Centerline Di	st. to Barrier:	100.0 feet		N	oise Si	ource Elev	vations	(in fee	of)		
Centerline Dist.	to Observer:	100.0 feet		-	0.00 0.	Autos:	0.0	00	~		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.2	97			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.0	04 (Grade Adi	ustment	: 0.0
P	ad Elevation:	0.0 feet				,					
Ro	ad Elevation:	0.0 feet		Li	ane Eq	uivalent L	Distance	e (in fe	eet)		
	Road Grade:	0.0%				Autos:	97.2	06			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	97.1	15			
	Right View:	90.0 degre	es		Heav	vy Trucks:	97.1	24			
FHWA Noise Mod	el Calculation	15									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresne	el E	Barrier Atte	en Ber	rm Atten
Autos:	70.20	-2.23		-4.43		-1.20	-	4.77	0.0	00	0.000
Medium Trucks:	81.00	-17.93		-4.43		-1.20	-	4.88	0.0	00	0.000
Heavy Trucks:	85.38	-11.92		-4.43		-1.20	-	5.16	0.0	00	0.000
Unmitigated Nois	e Levels (with	nout Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Da	y L	.eq Eve	ening	Leq N	ight	1	Ldn	C	NEL
Autos:	62	2.3	60.4		58.7		52.6		61.2		61.8
Medium Trucks:	57	7.4	55.9		49.6		48.0		56.5		56.7
Heavy Trucks:	67	7.8	66.4		57.4		58.6		67.0		67.1
Vehicle Noise:	69	9.2	67.7		61.4		59.9		68.3		68.5
Centerline Distan	ce to Noise C	ontour (in fee	t)								
				70 dE	BA	65 dE	BA	60) dBA	55	dBA
			Ldn:	77 166 358			7	71			
	CNEL:				80 172 371 799					'99	

	FHV	/A-RD-77-108	HIGHW	AY NC	DISE PF	REDICTIC		DEL			
Scenari	io: Existing Plu	s Project				Project N	lame: ŀ	(nox B	lusiness P	ark	
Road Nam	e: Harvill Av.					Job Nu	mber: 9	349			
Road Segmer	nt: n/o Oleande	er Av.									
SITE	SPECIFIC IN	PUT DATA				N	DISE N	IODE	L INPUT	S	
Highway Data				Si	ite Con	ditions (l	Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	10,913 vehicle	S				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 A	xles):	15		
Peak H	our Volume:	1,091 vehicles			He	avy Truck	is (3+ A	xles):	15		
Vei	hicle Speed:	50 mph		V	ehicle l	Mix					
Near/Far Lai	ne Distance:	48 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						AL	itos:	77.5%	12.9%	9.6%	87.839
Bar	rier Heiaht:	0.0 feet			Me	edium Tru	icks:	34.8%	4.9%	10.3%	2.45%
Barrier Type (0-W	all. 1-Berm):	0.0			ŀ	leavy Tru	icks:	36.5%	2.7%	10.8%	9.72%
Centerline Dis	st. to Barrier:	100.0 feet		AL	oloo Ce	uree Ele	votions	lin fe	041		
Centerline Dist.	to Observer:	100.0 feet		/14	uise sc	Autoo	vauons		el)		
Barrier Distance	to Observer:	0.0 feet			Modiu	Autos. n Trucko:	2.0	00			
Observer Height (Above Pad):	5.0 feet			Heav	v Trucks.	8.0	04	Grade Ad	iustment	0.0
Pa	ad Elevation:	0.0 feet			neav	y mucho.	0.0		0/440 / 14	dounioni	0.0
Roa	ad Elevation:	0.0 feet		Lá	ane Eq	uivalent l	Distanc	e (in f	leet)		
F	Road Grade:	0.0%				Autos:	97.2	206			
	Left View:	-90.0 degree	s		Mediur	n Trucks:	97.1	15			
	Right View:	90.0 degree	S		Heav	y Trucks:	97.1	24			
FHWA Noise Mode	el Calculations	5									
VehicleType	REMEL	Traffic Flow	Distar	ice	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	70.20	-2.48		-4.43		-1.20		4.77	0.0	000	0.00
Medium Trucks:	81.00	-18.03		-4.43		-1.20		4.88	0.0	000	0.00
Heavy Trucks:	85.38	-12.04		-4.43		-1.20		-5.16	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and I	oarrier a	ttenu	ation)						
VehicleType	Leq Peak Hou	r Leq Day	Le	eq Eve	ening	Leq N	light		Ldn	CI	VEL
Autos:	62.	1 6	0.2		58.4		52.4		61.0)	61.
Medium Trucks:	57.	3 5	5.8		49.5		47.9		56.4	1	56.
Heavy Trucks:	67.	7 6	6.3		57.3		58.5		66.9)	67.
Vehicle Noise:	69.	1 θ	7.5		61.2		59.7		68.2	2	68.
Centerline Distanc	ce to Noise Co	ntour (in feet)									
				70 dE	ЗA	65 d	BA	6	0 dBA	55	dBA
		L	.dn:	75		162	2		350	7	54
		÷.	-						000	_	~ 1

	FH ¹	WA-RD-77-108	HIGHW	AY NO	DISE PI	REDICTIC	N MODE	EL			
Scenari Road Nam Road Segmer	io: Existing Pl e: Harvill Av. nt: s/o Oleand	us Project ler Av.				Project N Job Nui	lame: Kr mber: 93	iox Business 49	Park		
SITE	SPECIFIC IN	NPUT DATA				NC	DISE MO	DEL INPU	TS		
Highway Data				S	ite Con	ditions (F	Hard = 10	0, Soft = 15)			
Average Daily	Traffic (Adt):	9,102 vehicl	es				AL	itos: 15			
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Ax	les): 15			
Peak H	our Volume:	910 vehicle	s		He	avy Truck	s (3+ Ax	les): 15			
Ve	hicle Speed:	50 mph		V	ohiclo	Mix					
Near/Far La	ne Distance:	48 feet		-	Veh	icleTyne	D	av Evenin	a Nie	aht	Daily
Site Data					1011	AL	itos: 77	7.5% 12.99	6 G	.6%	93.59%
Bai	rior Hoight	0.0 feet			M	edium Tru	cks: 84	4.8% 4.9%	6 10	.3%	1.15%
Barrier Type (0-W	all, 1-Berm):	0.0			ŀ	leavy Tru	cks: 86	6.5% 2.7%	6 10	.8%	5.27%
Centerline Dis	st. to Barrier:	100.0 feet		N	oise Sc	ource Ele	vations	(in feet)			
Centerline Dist.	to Observer:	100.0 feet		-		Autos:	0.00	0			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.29	7			
Observer Height (Observer Height (Above Pad): 5.0 feet				Heav	v Trucks:	8.00	⊿ Grade/	Adiustr	nent:	0.0
Pa	Pad Elevation: 0.0 feet					y maono.	0.00				
Roa	ad Elevation:	0.0 feet		Li	ane Eq	uivalent l	Distance	(in feet)			
I	Road Grade:	0.0%				Autos:	97.20	6			
	Left View:	-90.0 degre	es		Mediui	m Trucks:	97.11	5			
	Right View:	90.0 degre	es		Heav	ry Trucks:	97.12	4			
FHWA Noise Mode	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresnel	Barrier /	Atten	Berm	Atten
Autos:	70.20	-2.99		-4.43		-1.20	-4	.77	0.000		0.000
Medium Trucks:	81.00	-22.11		-4.43		-1.20	-4	.88	0.000		0.000
Heavy Trucks:	85.38	-15.49		-4.43		-1.20	-5	.16	0.000		0.000
Unmitigated Noise	e Levels (with	out Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Day	/ L	eq Eve	ening	Leq N	ight	Ldn		CN	EL
Autos:	61	.6	59.7		57.9		51.9	6	0.5		61.1
Medium Trucks:	53	3.3	51.8		45.4		43.8	5	2.3		52.5
Heavy Trucks:	64	1.3	62.8		53.8		55.1	6	3.4		63.5
Vehicle Noise:	66	5.4	64.8		59.5		57.0	6	5.4		65.7
Centerline Distant	ce to Noise C	ontour (in feet)						-		
			L	70 dE	ЗA	65 dl	BA	60 dBA		55 d	BA
			Ldn:	49 107 230			49	5			
	CNEL:					52 111 240 517					

	FH'	WA-RD-77-108	HIGHW	VAY N	IOISE PI	REDICTIC	ON MOI	DEL			
Scenar	io: Existing Pl	us Project				Project N	lame: I	Knox B	lusiness P	ark	
Road Nam Road Segme	nt: n/o Harley	wy Knox Bl.				JOD IVU	mber: S	9349			
SITE	SPECIFIC II	NPUT DATA				NC	DISE N	IODE	L INPUT	s	
Highway Data					Site Con	ditions (I	Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	38,600 vehicl	es					Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	cks (2 A	(xles):	15		
Peak H	lour Volume:	3,860 vehicle	s		He	avy Truck	is (3+ A	(xles):	15		
Ve	hicle Speed:	65 mph		-	Vehicle	Mix					
Near/Far La	ne Distance:	60 feet		-	Veh	icleType		Day	Evening	Night	Daily
Site Data						AL	itos:	77.5%	12.9%	9.6%	93.82%
Ba	rrier Heiaht:	0.0 feet			M	edium Tru	icks:	84.8%	4.9%	10.3%	1.09%
Barrier Type (0-W	all, 1-Berm):	0.0			1	Heavy Tru	icks:	86.5%	2.7%	10.8%	5.09%
Centerline Di	st. to Barrier:	100.0 feet		1	Voise So	ource Ele	vations	s (in fe	et)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.0	000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.2	297			
Observer Height (Observer Height (Above Pad): 5.0 feet					v Trucks:	8.0	004	Grade Ad	ustment	: 0.0
Pa	Pad Elevation: 0.0 feet										
Roa	ad Elevation:	0.0 feet		-	Lane Eq	uivalent l	Distand	ce (in f	eet)		
	Road Grade:	0.0%				Autos:	95.5	525			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.4	432			
	Right View:	90.0 degre	es		Heav	ry Trucks:	95.4	441			
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el i	Barrier Att	en Ber	rm Atten
Autos:	74.55	2.15		-4.32	2	-1.20		-4.77	0.0	00	0.000
Medium Trucks:	84.86	-17.21		-4.31	1	-1.20		-4.88	0.0	00	0.000
Heavy Trucks:	88.18	-10.50		-4.31	1	-1.20		-5.16	0.0	00	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrier	atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	/ [Leq Ev	/ening	Leq N	light		Ldn	C	NEL
Autos:	71	.2	69.3		67.5		61.5		70.1		70.7
Medium Trucks:	62	2.1	60.6		54.3		52.7		61.2	2	61.4
Heavy Trucks:	72	2.2	70.7		61.7		63.0		71.3	j.	71.4
Vehicle Noise:	74	1.9	73.3		68.7		65.5		74.0)	74.3
Centerline Distant	ce to Noise C	ontour (in fee	t)								
				70 c	1BA	65 di	BA	6	0 dBA	55	dBA
			Ldn:	184 397 856			1,	844			
	CNEL:					194 418 901 1,940					940

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	FH\	WA-RD-77-108	B HIGH	WAY N	NOISE P	REDICTI	ON MO	DEL			
Scenai Road Nan Road Segme	rio: Existing Pli ne: I-215 SB F ent: s/o Harley	us Project wy Knox BI.				Project Job Ni	Name: I umber: 9	Knox 9349	Business Pa	ark	
SITE	SPECIFIC IN	NPUT DATA				N	OISE N	IODE	L INPUTS	3	
Highway Data					Site Cor	nditions ((Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	34,923 vehicl	es				,	Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A	(xles)	15		
Peak H	-lour Volume:	3,492 vehicle	s		He	avy Truc	:ks (3+ A	(xles)	15		
Ve	ehicle Speed:	65 mph		+	Vohiclo	Mix					
Near/Far La	ane Distance:	60 feet		-	Venicle	nicleType		Dav	Evenina	Niaht	Daily
Site Data					101	A	utos:	77.5%	5 12.9%	9.69	% 93.44%
Ba	rrier Height	0.0 feet			М	edium Tr	ucks:	84.8%	4.9%	10.39	% 1.17%
Barrier Type (0-V	Vall, 1-Berm):	0.0				Heavy Tr	ucks:	86.5%	2.7%	10.89	6 5.39%
Centerline Di	ist. to Barrier:	100.0 feet		-	Noise S	ource El	ovation	e (in f	oot)		
Centerline Dist.	to Observer:	100.0 feet		H	10/30 0	Autor	. 00	300			
Barrier Distance	Barrier Distance to Observer: 0.0 feet				Modiu	m Trucks	. 0.0	207			
Observer Height	Observer Height (Above Pad): 5.0 feet				Hoa	n/ Trucks	. <u>2</u> .2	104	Grade Adi	ustmei	<i>at:</i> 0.0
P	Pad Elevation: 0.0 feet				nea	ry mucha	. 0.0	-04	erade ridj	aoumoi	. 0.0
Ro	Road Elevation: 0.0 feet				Lane Eq	uivalent	Distanc	ce (in	feet)		
	Road Grade:	0.0%				Autos	s: 95.8	525			
	Left View:	-90.0 degre	es		Mediu	m Trucks	8: 95.4	432			
	Right View:	90.0 degre	es		Hear	vy Trucks	s: 95.4	441			
FHWA Noise Mod	lel Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el	Barrier Atte	en B	erm Atten
Autos:	74.55	1.70		-4.3	2	-1.20		-4.77	0.0	00	0.000
Medium Trucks:	84.86	-17.31		-4.3	1	-1.20		-4.88	0.0	00	0.000
Heavy Trucks:	88.18	-10.69		-4.3	1	-1.20		-5.16	0.0	00	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrie	er atter	nuation)						
VehicleType	Leq Peak Hou	ur Leq Daj	V	Leq E	vening	Leq I	Night		Ldn	(CNEL
Autos:	70).7	68.8		67.1		61.0		69.6		70.2
Medium Trucks:	62	2.0	60.5		54.2		52.6		61.1		61.3
Heavy Trucks:	72	2.0	70.6		61.5		62.8		71.1		71.3
Vehicle Noise:	74	1.7	73.0		68.3		65.2		73.7		74.0
Centerline Distan	ce to Noise C	ontour (in fee	t)								
				70	70 dBA 65 dBA 60 dBA		5	5 dBA			
			Ldn:	17	176 380 819		819		1,764		
	CNEL:				185 400 861 1,854					1,854	

	FHW	A-RD-77-106	HIGH	IWATN	UISE PR	EDICI		ODEL			
Scenario: Exis	sting Plu	s Project				Project	Name	: Knox	Business P	ark	
Road Name: 1-21	5 NB Fv	vy				Job N	lumber.	9349			
Road Segment: n/o	Harley K	(nox Bl.									
SITE SPECI	FIC IN	PUT DATA				N	IOISE	MODE	EL INPUT	S	
Highway Data				S	Site Con	ditions	(Hard	= 10, S	oft = 15)		
Average Daily Traffic	(Adt):	33,653 vehicle	es					Autos	15		
Peak Hour Percer	itage:	10%			Me	dium Tr	ucks (2	Axles)	: 15		
Peak Hour Vo	lume:	3,365 vehicle	s		He	avy Tru	cks (3+	Axles)	: 15		
Vehicle S	peed:	65 mph		V	ehicle l	Mix					
Near/Far Lane Dist	ance:	60 feet			Vehi	icleType	;	Day	Evening	Night	Daily
Site Data							Autos:	77.5%	6 12.9%	9.6%	92.36
Barrier He	eiaht:	0.0 feet			Me	edium T	rucks:	84.8%	6 4.9%	10.3%	1.42
Barrier Type (0-Wall, 1-E	lerm):	0.0			ŀ	leavy T	rucks:	86.5%	6 2.7%	10.8%	6.23
Centerline Dist. to B	arrier:	100.0 feet			loise Sc	urco F	lovatio	ne (in t	(oot)		
Centerline Dist. to Obs	erver:	100.0 feet		-	10/36 30	Auto	evau0	000	eel)		
Barrier Distance to Obs	erver:	0.0 feet			Modiu	n Truck	o. (207			
Observer Height (Above	Pad):	5.0 feet			Hoov	n Truck	o. 2	2.2.57	Grade Ad	iustmont	
Pad Elev	ation:	0.0 feet			neav	y much	a. (5.004	Onduc Hu	usunom	. 0.0
Road Elev	ation:	0.0 feet		L	ane Eq	uivalen	t Dista	nce (in	feet)		
Road G	irade:	0.0%				Auto	s: 98	5.525			
Left	View:	-90.0 degree	es		Mediur	n Truck	s: 95	5.432			
Right	View:	90.0 degree	es		Heav	y Truck	s: 98	5.441			
FHWA Noise Model Calc	ulations	;									
VehicleType REI	ЛЕL	Traffic Flow	Dis	stance	Finite	Road	Fres	snel	Barrier Att	en Ber	m Atter
Autos:	74.55	1.49		-4.32		-1.20		-4.77	0.0	000	0.00
Medium Trucks:	84.86	-16.65		-4.31		-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	88.18	-10.22		-4.31		-1.20		-5.16	0.0	000	0.00
Unmitigated Noise Level	's (witho	out Topo and	barri	er atteni	uation)						
VehicleType Leq Pe	eak Hou	r Leq Day	r -	Leq Ev	ening	Leq	Night		Ldn	C	NEL
Autos:	70.	5	68.6		66.8		60	.8	69.4	4	70
Medium Trucks:	62.	7	61.2		54.8		53	.3	61.3	7	62
Heavy Trucks:	72.	4	71.0		62.0		63	.2	71.6	6	71.
Vehicle Noise:	74.	9	73.3		68.3		65	.5	73.9	9	74
Centerline Distance to N	oise Co	ntour (in feet)					_			
			L	70 d	BA	65	dBA		60 dBA	55	dBA
			Ldn:	18	3	3	93		847	1,	825
		CI	VEL:	19	1	4	12		888	1,	914

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL Scenario: Existing Plus Project Road Name: I-215 NB Fwy Project Name: Knox Business Park Job Number: 9349 Road Segment: s/o Harley Knox Bl. SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 27,800 vehicles Peak Hour Percentage: 10% Autos: 15 Medium Trucks (2 Axles): 15 Peak Hour Volume: 2,780 vehicles Heavy Trucks (3+ Axles): 15 65 mph Vehicle Speed: Vehicle Mix Near/Far Lane Distance: 60 feet Day Evening Night Daily VehicleType Site Data Autos: 77.5% 12.9% 9.6% 93.82% Medium Trucks: 84.8% 4.9% 10.3% 1.09% Barrier Height: Barrier Type (0-Wall, 1-Berm): 0.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 5.09% 0.0 Centerline Dist. to Barrier: Centerline Dist. to Observer: 100.0 feet Noise Source Elevations (in feet) 100.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Grade Adjustment: 0.0 Heavy Trucks: 8.004 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Elevation: 0.0 feet Road Grade: Autos: 95.525 0.0% Medium Trucks: Left View: -90.0 degrees 95.432 Right View: Heavy Trucks: 95.441 90.0 degrees FHWA Noise Model Calculatio VehicleType REMEL Autos: 74. Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten 74.55 0.73 -4.32 -1.20 -4.77 0.000 0.000 -4.31 -1.20 Medium Trucks: 84.86 -18.64 -4.88 0.000 0.000 Heavy Trucks: 88.18 -11.93 -4.31 -1.20 -5.16 0.000 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour CNEL Leq Day Leq Evening 67.9 66.1 Leq Night Ldn 68.7 Autos 69.8 60.0 69.3 Medium Trucks: 59.2 52.8 60.7 51.3 59.8 60.0 Heavy Trucks: 70.7 69.3 60.3 61.5 69.9 70.0 Vehicle Noise: 73.5 71.9 67.3 64.1 72.6 72.9 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 148 319 688 1,481 CNEL: 156 336 724 1,559

	FHV	WA-RD-77-108	HIGHW		JISE PR	EDICT		DEL			
Scenari	o: Existing Plu	us Project				Project	Name:	Knox	Business P	ark	
Road Nam	e: Harley Kno	x BI.				Job N	umber:	9349			
Road Segmen	nt: e/o Harvill /	Av.									
SITES	SPECIFIC IN	IPUT DATA				N	OISE	MODE		s	
Highway Data				S	ite Cond	ditions	(Hard =	: 10, S	oft = 15)		
Average Daily	Traffic (Adt):	11,713 vehicle	s					Autos:	15		
Peak Hour	Percentage:	10%			Mec	dium Tru	ucks (2	Axles).	15		
Peak H	our Volume:	1,171 vehicles	5		Hea	avy Truc	cks (3+	Axles).	15		
Vel	hicle Speed:	45 mph		V	ehicle N	lix					
Near/Far Lar	ne Distance:	54 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						A	Autos:	77.5%	12.9%	9.6%	88.24%
Bar	rier Heiaht:	0.0 feet			Me	dium Tr	ucks:	84.8%	4.9%	10.3%	2.35%
Barrier Type (0-W	all, 1-Berm):	0.0			н	leavy Tr	ucks:	86.5%	2.7%	10.8%	9.41%
Centerline Dis	at. to Barrier:	100.0 feet		N	loise So	urce El	evatior	s (in f	eet)		
Centerline Dist.	to Observer:	100.0 feet		-		Autos	s [.] 0	000			
Barrier Distance t	to Observer:	0.0 feet			Mediun	n Trucks	s: 2	297			
Observer Height (Above Pad):	5.0 feet			Heav	v Trucks	s. 8	004	Grade Ad	iustment	: 0.0
Pa	ad Elevation:	0.0 feet			moury	/ ////////	. 0.				
Roa	ad Elevation:	0.0 feet		L	ane Equ	iivalent	Distan	ce (in	feet)		
F	Road Grade:	0.0%				Autos	s: 96	.416			
	Left View:	-90.0 degree	s		Mediun	n Trucks	s: 96	.324			
	Right View:	90.0 degree	s		Heavy	y Trucks	s: 96	.333			
FHWA Noise Mode	el Calculation	s		-							
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite I	Road	Fres	nel	Barrier Att	en Bei	rm Atten
Autos:	68.46	-1.69		-4.38		-1.20		-4.77	0.0	000	0.000
Medium Trucks:	79.45	-17.44		-4.37		-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	84.25	-11.42		-4.38		-1.20		-5.16	0.0	000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Hou	ır Leq Day	L	eq Eve	ening	Leq	Night		Ldn	С	NEL
Autos:	61	.2	59.3		57.5		51.	5	60.1		60.7
Medium Trucks:	56	.4	54.9		48.6		47.		55.5	5	55.7
Heavy Trucks:	67	.3	5.8		56.8		58.	1	66.4	1	66.5
venicie Noise:	68	.5	0.10		60.5		59.	2	67.6)	67.8
Centerline Distance	e to Noise Co	ontour (in feet)						1			
				70 dl	BA	65 (dBA		50 dBA	55	dBA
			_dn:	69		14	49		321	6	591
		Cl	IEL:	72		15	54		332	7	15

Monday, June 08, 2015

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	FH	WA-RD-77-10	B HIGHV	NAY NO	DISE P	REDICTIO	ом ис	DEL			
Scenar Road Nan Road Segme	io: Existing Pl ne: Harley Kno nt: e/o I-215 \$	lus Project ox Bl. SB Fwy Ramps				Project I Job Nu	Vame: H Imber: S	(nox 9349	Business Pa	ırk	
SITE	SPECIFIC I	NPUT DATA				N	OISE N	IODE	L INPUTS	;	
Highway Data				S	ite Cor	nditions (Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	13,590 vehic	les				1	Autos.	15		
Peak Hour	Percentage:	10%			Me	dium Tru	cks (2 A	xles).	15		
Peak H	lour Volume:	1,359 vehicle	es		He	avy Truc	ks (3+ A	xles)	15		
Ve	hicle Speed:	45 mph		V	ohiclo	Mix					
Near/Far La	ne Distance:	54 feet		-	Veh	nicleType		Dav	Evenina	Niaht	Daily
Site Data						A	utos:	77.5%	6 12.9%	9.6%	90.01%
Ba	rrier Heiaht [.]	0.0 feet			М	edium Tru	ucks:	84.8%	4.9%	10.3%	1.95%
Barrier Type (0-W	/all, 1-Berm):	0.0				Heavy Tru	ucks:	86.5%	s 2.7%	10.8%	8.04%
Centerline Di	st. to Barrier:	100.0 feet		N	loise S	ource Ele	vation	: (in f	eet)		
Centerline Dist.	to Observer:	100.0 feet		-	0.00 0	Autos	· 0.0	000	000)		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks	· 22	97			
Observer Height	(Above Pad):	5.0 feet			Hear	v Trucks	8.0	04	Grade Adiu	ıstment	0.0
P	ad Elevation:	0.0 feet				,					
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Distanc	e (in	feet)		
	Road Grade:	0.0%				Autos	: 96.4	116			
	Left View:	-90.0 degre	ees		Mediu	m Trucks	: 96.3	324			
	Right View:	90.0 degre	es		Hear	vy Trucks	: 96.3	333			
FHWA Noise Mod	el Calculatio	ns									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresn	el	Barrier Atte	n Ber	m Atten
Autos:	68.46	6 -0.96	6	-4.38		-1.20		4.77	0.00	00	0.000
Medium Trucks:	79.45	5 -17.60)	-4.37		-1.20		-4.88	0.00	00	0.000
Heavy Trucks:	84.25	5 -11.45		-4.38		-1.20		-5.16	0.00	00	0.000
Unmitigated Nois	e Levels (witl	hout Topo and	l barrier	r attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	y .	Leq Eve	ening	Leq N	light		Ldn	C	NEL
Autos:	6	1.9	60.0		58.3		52.2		60.8		61.4
Medium Trucks:	50	6.3	54.8		48.4		46.9		55.3		55.6
Heavy Trucks:	6	7.2	65.8		56.8		58.0		66.4		66.5
Vehicle Noise:	6	8.6	67.1		60.8		59.3		67.7		67.9
Centerline Distan	ce to Noise C	contour (in fee	t)								
				70 dl	BA	65 a	IBA		60 dBA	55	dBA
			Ldn:	70		15	1		326	7	02
		C	NEL:	73		15	7		338	7	28

					EBIOTIO	111000			
Scenario	D: Existing Plu	is Project			Project Na	ame: Kn	ox Business F	ark	
Road Name	e: Harley Kno	x BI.			Job Nur	iber: 93	49		
Road Segmen	t: e/o I-215 N	B Fwy Ramps							
SITES	SPECIFIC IN	PUT DATA			NO	ISE MO	DEL INPUT	S	
Highway Data				Site Cor	nditions (H	ard = 10), Soft = 15)		
Average Daily	Traffic (Adt):	15,837 vehicles				Au	tos: 15		
Peak Hour I	Percentage:	10%		Me	dium Truck	is (2 Axl	es): 15		
Peak He	our Volume:	1,584 vehicles		He	avy Trucks	(3+ Axl	es): 15		
Vel	nicle Speed:	45 mph		Vehicle	Mix				
Near/Far Lar	ne Distance:	54 feet		Veh	icleTvpe	Da	av Evenina	Night	Dailv
Site Data					Aut	os: 77	.5% 12.9%	9.6%	93.669
Bar	rior Hoiaht	0.0 feet		М	edium Truc	ks: 84	.8% 4.9%	10.3%	1.129
Barrier Type (0-Wa	all. 1-Berm):	0.0			Heavy Truc	ks: 86	.5% 2.7%	10.8%	5.21%
Centerline Dis	t. to Barrier:	100.0 feet		Noice C	ourse Elev	otiono (in feet)		
Centerline Dist. t	o Observer:	100.0 feet		NOISE SI	Autoor		in leel)		
Barrier Distance t	o Observer:	0.0 feet		Modiu	m Trucko:	2.20	7		
Observer Height (/	Above Pad):	5.0 feet		Hoo	a Trucks:	2.29	1 Grade An	liustmont	. 0.0
Pa	d Elevation:	0.0 feet		near	ly mucho.	0.00		Juounone	0.0
Roa	d Elevation:	0.0 feet		Lane Eq	uivalent D	istance	(in feet)		
F	Road Grade:	0.0%			Autos:	96.41	6		
	Left View:	-90.0 degrees		Mediu	m Trucks:	96.32	4		
	Right View:	90.0 degrees		Heav	/y Trucks:	96.33	3		
FHWA Noise Mode	Calculation	s							
VehicleType	REMEL	Traffic Flow	Distand	e Finite	Road	Fresnel	Barrier At	ten Ber	m Atten
Autos:	68.46	-0.13	-	4.38	-1.20	-4.	.77 0.0	000	0.00
Medium Trucks:	79.45	-19.33	-	4.37	-1.20	-4.	.88 0.0	000	0.00
Heavy Trucks:	84.25	-12.67	-	4.38	-1.20	-5.	.16 0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and b	arrier at	tenuation)					
VehicleType	Leq Peak Hou	r Leq Day	Le	q Evening	Leq Nig	ght	Ldn	C	VEL
Autos:	62	.8 60).9	59.1		53.0	61.	7	62.
Medium Trucks:	54	.5 53	3.0	46.7		45.1	53.	6	53.
Heavy Trucks:	66	.0 64	1.6	55.6		56.8	65.	2	65.
Vehicle Noise:	67	.9 66	3.3	60.9		58.5	67.	0	67.
Centerline Distanc	e to Noise Co	ontour (in feet)		70 dBA	65 40		60 dBA	FF	dRA
			den	CO OBA	00 dB	м	00 0BA		UDA
		LI Chil		03	135		291	6	21
		CINE	-L.:	CO	141		.504	6	an)

	FH\	WA-RD-77-108	HIGH	IWAY N	OISE P	REDICT		DEL			
Scenari Road Nam Road Segmen	 D: Existing Plue D: Oleander A D: Oleander A D: Oleander A 	us Project w. ay 6				Project Job N	Name: H lumber: S	Knox E 9349	Business Pa	ark	
SITE S	SPECIFIC IN	IPUT DATA				N	IOISE N	IODE	L INPUTS	3	
Highway Data				5	Site Col	nditions	(Hard =	10, Sc	oft = 15)		
Average Daily Peak Hour Peak Hi Val	Traffic (Adt): Percentage: our Volume:	2,215 vehicl 10% 222 vehicle	es s		Me He	edium Tri eavy Truc	A ucks (2 A cks (3+ A	Autos: (xles): (xles):	15 15 15		
Near/Far Lar	no Distanca:	36 feet		١	/ehicle	Mix					
Site Data	le Distance.	30 1661			Vel	nicleType	Autos:	Day 77 5%	Evening 12.9%	Night 9.6%	Daily
Drug Drug	ula u Haladada	0.0 ()			N	, Iedium Ti	rucks:	84.8%	4.9%	10.3%	8.04%
Barrier Type (0-Wa	all, 1-Berm):	0.0 feet				Heavy Ti	rucks:	86.5%	2.7%	10.8%	28.63%
Centerline Dis	t. to Barrier:	100.0 feet			Voise S	ource El	levations	s (in fe	et)		
Centerline Dist. t Barrier Distance t Observer Height (/ Pa	to Observer: to Observer: Above Pad): td Elevation:	100.0 feet 0.0 feet 5.0 feet 0.0 feet			Mediu Hea	Auto: m Truck: vy Truck: wiyalem	s: 0.0 s: 2.2 s: 8.0	000 297 004	Grade Adj	ustmen	t: 0.0
Rua	a Elevation.	0.0 feet		F		Auto	e· 08/	10/	001/		
	Left View: Right View:	-90.0 degre 90.0 degre	es es		Mediı. Hea	m Truck vy Truck	s: 98.4 s: 98.4	404 413			
FHWA Noise Mode	l Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el	Barrier Atte	en Be	rm Atten
Autos:	66.51	-9.86		-4.52	2	-1.20		-4.77	0.0	00	0.000
Medium Trucks:	77.72	-18.82		-4.51	l	-1.20		-4.88	0.0	00	0.000
Heavy Trucks:	82.99	-13.30		-4.51		-1.20		-5.16	0.0	00	0.000
Unmitigated Noise	Levels (with	out Topo and	barrie	er atten	uation)			r		r	
VehicleType	Leq Peak Hou	ur Leq Day	/	Leq Ev	ening	Leq	Night		Ldn	C	NEL
Autos:	50	1.9	49.0		47.3		41.2		49.8		50.4
Meaium Trucks:	53	.2	51.7		45.3		43.8		52.2		52.5
Vehicle Noise:	64	l.5	63.1		53.5 54.9)	54.8 55.3		63.1 63.6		63.2
Centerline Distance	e to Noise C	ontour (in feel	:)				-				
		1		70 c	IBA	65	dBA	6	0 dBA	55	5 dBA
			Ldn:	38	3	8	31	1	175		377
		C	NEL:	39	Ð	8	33		179		386

	FH'	WA-RD-77-108	HIGHV	VAY NO	DISE P	REDICTIO	N MOD	EL			
Scenar Road Narr Road Segme	io: Existing PI le: Oleander A nt: w/o Harvill	us Project w. Av.				Project N Job Nui	ame: Ki nber: 93	nox B 349	usiness Pa	ark	
SITE	SPECIFIC I	IPUT DATA				NC	ISE M	ODEL	. INPUTS	5	
Highway Data				S	ite Cor	ditions (H	lard = 1	0, So	ft = 15)		
Average Daily	Traffic (Adt):	2,615 vehicl	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Ax	des):	15		
Peak H	lour Volume:	262 vehicle	s		He	avy Truck	s (3+ Ax	des):	15		
Ve	hicle Speed:	40 mph		V	ohiclo	Mix					
Near/Far La	ne Distance:	36 feet		-	Veh	icleTvpe	D)av	Evenina	Niaht	Daily
Site Data						Au	tos: 7	7.5%	12.9%	9.6%	68.00%
Ba	rrier Height	0.0 feet			М	edium Tru	cks: 8	4.8%	4.9%	10.3%	6.98%
Barrier Type (0-W	all, 1-Berm):	0.0			1	Heavy Tru	cks: 8	6.5%	2.7%	10.8%	6 25.03%
Centerline Di	st. to Barrier:	100.0 feet		A	loise S	ource Ele	ations	(in fe	of)		
Centerline Dist.	to Observer:	100.0 feet			0.00 0	Autos:	0.00	0			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.29	97			
Observer Height	Above Pad):	5.0 feet			Heav	/v Trucks:	8.00)4	Grade Adji	ustmer	nt: 0.0
P	ad Elevation:	0.0 feet			moun	.,	0.00				
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent L	Distance	e (in fe	eet)		
	Road Grade:	0.0%				Autos:	98.49	94			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	98.40)4			
	Right View:	90.0 degre	es		Heav	/y Trucks:	98.41	13			
FHWA Noise Mod	el Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fresne	1 E	Barrier Atte	en Be	erm Atten
Autos:	66.51	-8.83		-4.52		-1.20	-4	4.77	0.0	00	0.000
Medium Trucks:	77.72	-18.72		-4.51		-1.20	-4	4.88	0.0	00	0.000
Heavy Trucks:	82.99	-13.17		-4.51		-1.20	-8	5.16	0.0	00	0.000
Unmitigated Nois	e Levels (with	out Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Day	1	Leq Ev	ening	Leq N	ight		Ldn	(CNEL
Autos:	52	2.0	50.1		48.3		42.2		50.9		51.5
Medium Trucks:	53	1.3	51.8		45.4		43.9		52.3		52.6
Heavy Trucks:	64	l.1	62.7		53.7		54.9		63.3		63.4
Vehicle Noise:	64	1.7	63.2		55.2		55.4		63.8		64.0
Centerline Distan	ce to Noise C	ontour (in feet)	_	-			_			
				70 di	BA	65 di	BA	60) dBA	5	5 dBA
			Ldn:	39		83			180		387
		C	VEL:	40		86			184		397

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	FH	WA-RD-77-10	B HIGH	IWAY N	IOISE P	REDICTIC	N MODE	L		
Scenai Road Nan Road Segme	rio: Year 2017 ne: Harvill Av. ent: s/o Harley	Without Proje Knox Bl.	ct			Project N Job Nu	lame: Kno mber: 934	ox Business P 19	ark	
SITE	SPECIFIC II	NPUT DATA				NC	DISE MO	DEL INPUT	S	
Highway Data					Site Cor	nditions (l	Hard = 10	Soft = 15)		
Average Daily	Traffic (Adt):	11,900 vehic	les				Aut	os: 15		
Peak Hour	Percentage:	10%			Me	edium Truc	cks (2 Axle	es <i>):</i> 15		
Peak H	Hour Volume:	1,190 vehicle	es		He	avy Truck	is (3+ Axle	es): 15		
Ve	ehicle Speed:	50 mph			Vehicle	Mix				
Near/Far La	ane Distance:	48 feet		F	Veh	nicleType	Da	y Evening	Night	Daily
Site Data						AL	itos: 77	5% 12.9%	9.6%	93.82%
Ba	rrier Heiaht:	0.0 feet			М	edium Tru	cks: 84	8% 4.9%	10.3%	1.09%
Barrier Type (0-V	Vall, 1-Berm):	0.0			1	Heavy Tru	cks: 86	5% 2.7%	10.8%	5.09%
Centerline Di	ist. to Barrier:	100.0 feet			Noise S	ource Ele	vations (i	n feet)	-	
Centerline Dist.	to Observer:	100.0 feet		F		Autos	0.000		-	
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2 297			
Observer Height	(Above Pad):	5.0 feet			Hear	w Trucks:	8 004	Grade Ad	iustment:	0.0
P	ad Elevation:	0.0 feet			mou	<i>iy maono.</i>	0.00		,	
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalent l	Distance	(in feet)		
	Road Grade:	0.0%				Autos:	97.206	5		
	Left View:	-90.0 degre	es		Mediu	m Trucks:	97.115			
	Right View:	90.0 degre	ees		Hear	vy Trucks:	97.124	ŀ		
FHWA Noise Mod	lel Calculatior	ıs							-	
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresnel	Barrier Att	en Berr	n Atten
Autos:	70.20	-1.82	2	-4.43	3	-1.20	-4.	77 0.0	000	0.000
Medium Trucks:	81.00	-21.18	;	-4.43	3	-1.20	-4.	88 0.0	000	0.000
Heavy Trucks:	85.38	-14.47	,	-4.43	3	-1.20	-5.	16 0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	l barrie	er atten	uation)					
VehicleType	Leq Peak Ho	ur Leq Da	y	Leg Ev	vening	Leq N	light	Ldn	CN	IEL
Autos:	62	2.8	60.9		59.1		53.0	61.7	7	62.3
Medium Trucks:	54	4.2	52.7		46.3		44.8	53.2	2	53.5
Heavy Trucks:	65	5.3	63.9		54.8		56.1	64.4	4	64.6
Vehicle Noise:	67	7.4	65.8		60.6		58.0	66.5	5	66.8
Centerline Distan	ce to Noise C	ontour (in fee	t)							-
				70 c	dBA	65 d	BA	60 dBA	55 (dBA
			Ldn:	5	8	125	5	270	58	32
		C	NEL:	6	1	131	1	283	60)9

				1010211	EBIGING				
Scenario	b: Year 2017 V	Vithout Project			Project Na	ame: Kr	iox Business F	Park	
Road Name	e: Harvill Av.				Job Num	ber: 93	49		
Road Segmen	t: n/o Oleande	r Av.							
SITE S	PECIFIC IN	PUT DATA			NO	ISE MO	DEL INPUT	S	
Highway Data				Site Con	ditions (H	ard = 10	0, Soft = 15)		
Average Daily 1	raffic (Adt):	11,700 vehicles				Au	tos: 15		
Peak Hour I	Percentage:	10%		Mee	dium Truck	is (2 Axi	les): 15		
Peak Ho	our Volume:	1,170 vehicles		Hea	avy Trucks	(3+ Ax	les): 15		
Veh	icle Speed:	50 mph		Vehicle I	Nix				
Near/Far Lan	e Distance:	48 feet	ľ	Vehi	cleType	D	ay Evening	Night	Daily
Site Data					Aut	os: 77	7.5% 12.9%	9.6%	93.829
Bar	rier Heiaht:	0.0 feet		Me	edium Truc	ks: 84	1.8% 4.9%	10.3%	1.09%
Barrier Type (0-Wa	all, 1-Berm):	0.0		F	leavy Truc	ks: 86	6.5% 2.7%	10.8%	5.09%
Centerline Dis	t. to Barrier:	100.0 feet	-	Noiso Sa	urco Elov	ations	(in foot)		
Centerline Dist. t	o Observer:	100.0 feet	ŀ	110/30 00	Autos:	0.00	0		
Barrier Distance t	o Observer:	0.0 feet		Modiur	n Trucke	2.20	7		
Observer Height (A	Above Pad):	5.0 feet		Heav	v Trucks:	8.00	, 4. Grade Ac	liustment	0.0
Pa	d Elevation:	0.0 feet		mour	y maono.	0.00		,	
Roa	d Elevation:	0.0 feet		Lane Equ	uivalent D	istance	(in feet)		
F	oad Grade:	0.0%			Autos:	97.20	6		
	Left View:	-90.0 degrees		Mediur	n Trucks:	97.11	5		
	Right View:	90.0 degrees		Heav	y Trucks:	97.12	4		
FHWA Noise Mode	l Calculations								
VehicleType	REMEL	Traffic Flow D	listance	Finite	Road	Fresnel	Barrier At	ten Ber	m Atten
Autos:	70.20	-1.89	-4.4	3	-1.20	-4	.77 0.	000	0.00
Medium Trucks:	81.00	-21.26	-4.4	3	-1.20	-4	.88 0.	000	0.00
Heavy Trucks:	85.38	-14.54	-4.4	3	-1.20	-5	.16 0.	000	0.00
Unmitigated Noise	Levels (witho	out Topo and bar	rier attei	nuation)					
VehicleType	Leq Peak Hou	 Leq Day 	Leq E	vening	Leq Nig	pht	Ldn	C	NEL
Autos:	62.	7 60.8	3	59.0		53.0	61.	6	62.
Medium Trucks:	54.	1 52.6	5	46.2		44.7	53.	2	53.
Heavy Trucks:	65.	2 63.8	5	54.7		56.0	64.	4	64.
Vehicle Noise:	67.	3 65.8	5	60.6		58.0	66.	4	66.
Centerline Distanc	e to Noise Co	ntour (in feet)	70	dBΔ	65 dP	Δ	60 dBA	55	dBA
		l da	. 10	38	124	-	267		76
		CNEL		,0 :0	124		280	e e	
		UNEL.			130		200		

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	FHW	/A-RD-77-108 H	IIGHV	VAY N	IOISE PI	REDICT	ION MC	DEL			
Scenario. Road Name. Road Segment.	: Year 2017 V : Harvill Av. : s/o Oleande	Vithout Project er Av.				Project Job N	Name: lumber:	Knox 9349	Business P	ark	
SITE SI	PECIFIC IN	PUT DATA					OISE	MODE		S	
Highway Data				5	Site Con	ditions	(Hard =	= 10, S	oft = 15)		
Average Daily Ti	raffic (Adt):	10,900 vehicles	5					Autos:	15		
Peak Hour P	ercentage:	10%			Me	dium Ir	ucks (2	Axles):	15		
Peak Ho	ur Volume:	1,090 vehicles			He	avy Iru	CKS (3+	Axles):	15		
Vehi	cle Speed:	50 mph		١	Vehicle I	Mix					
Near/Far Lane	e Distance:	48 feet			Veh	icleType	9	Day	Evening	Night	Daily
Site Data						,	Autos:	77.5%	6 12.9%	9.6%	6 93.82%
Barri	ier Heiaht:	0.0 feet			M	edium T	rucks:	84.8%	6 4.9%	10.3%	6 1.09%
Barrier Type (0-Wa	II, 1-Berm):	0.0			ŀ	Heavy T	rucks:	86.5%	2.7%	10.8%	5.09%
Centerline Dist.	to Barrier:	100.0 feet		,	Voise Sr	urce F	lovation	ıs (in f	oot)		
Centerline Dist. to	Observer:	100.0 feet		-	10/30 00	Auto	o' 0	000			
Barrier Distance to	Observer:	0.0 feet			Modiu	m Truck	s. 0 e 2	297			
Observer Height (A	bove Pad):	5.0 feet			Heat	N Truck	s. = s. 8	004	Grade Ad	iustmen	t: 0.0
Pad	Elevation:	0.0 feet			mour	y maon	0. 0				
Road	Elevation:	0.0 feet		1	.ane Eq	uivalen	t Distar	ice (in	feet)		
Ro	oad Grade:	0.0%				Auto	s: 97	.206			
	Left View:	-90.0 degrees	6		Mediu	m Truck	s: 97	.115			
F	Right View:	90.0 degrees	5		Heav	ry Truck	s: 97	.124			
FHWA Noise Model	Calculations	6									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fres	nel	Barrier Att	en Be	erm Atten
Autos:	70.20	-2.20		-4.43	3	-1.20		-4.77	0.0	000	0.000
Medium Trucks:	81.00	-21.57		-4.43	3	-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	85.38	-14.85		-4.43	3	-1.20		-5.16	0.0	000	0.000
Unmitigated Noise	Levels (with	out Topo and b	arrier	atten	uation)						
VehicleType L	eq Peak Hou	r Leq Day	1	Leq Ev	/ening	Leq	Night		Ldn	0	ONEL
Autos:	62.	4 6	0.5		58.7		52.	7	61.3	3	61.9
Medium Trucks:	53.	8 5	2.3		45.9		44.	4	52.9)	53.1
Vehicle Noise:	64.	9 6 0 6	3.5 5.5		54.4 60.3		55. 57.	7	64.0)	64.2
Centerline Distance	to Noise Co	ntour (in feet)	-								
2 Distance				70 c	IBA	65	dBA		60 dBA	5	5 dBA
		L	dn:	55	5	1	18		255		549
		CN	EL:	57	7	1	24		267		575

	FH'	WA-RD-77-108	HIGHWA	Y NOISE P	REDICTION	MODEL			
Scenai Road Nan Road Segme	rio: Year 2017 ne: I-215 SB F ent: n/o Harley	Without Projec wy Knox Bl.	t		Project Nai Job Numl	ne: Knox ber: 9349	Business P	ark	
SITE	SPECIFIC II	NPUT DATA			NOI	SE MOD	EL INPUT	5	
Highway Data				Site Co.	nditions (Ha	rd = 10, \$	Soft = 15)		
Average Daily	Traffic (Adt):	51,000 vehicle	es			Autos	: 15		
Peak Hour	Percentage:	10%		Me	edium Trucks	a (2 Axles)): 15		
Peak H	our Volume:	5,100 vehicle	5	He	eavy Trucks	(3+ Axles): 15		
Ve	ehicle Speed:	65 mph		Vahiala	Mix				
Near/Far La	ne Distance:	60 feet		Velicie	hicleTyne	Dav	Evenina	Niaht	Daily
Site Data					Auto	s: 77.5	% 12.9%	9.6%	93.82%
Pa	rrior Hoight:	0.0 foot		N	ledium Truck	s: 84.8	% 4.9%	10.3%	1.09%
Barrier Type (0-V	Vall 1-Rerm)	0.0 1001			Heavy Truck	s: 86.5	% 2.7%	10.8%	5.09%
Centerline D	ist. to Barrier:	100.0 feet		Noice C	ourse Eleve	tiono (in	fact		
Centerline Dist.	to Observer:	100.0 feet		Noise 3	Ource Eleva		ieel)		
Barrier Distance	to Observer:	0.0 feet		14-16	Autos:	0.000			
Observer Height	(Above Pad):	5.0 feet		Weall	ITT TRUCKS:	2.297	Grada Ad	ustmont.	0.0
P	ad Elevation:	0.0 feet		пеа	vy mucks.	0.004	Grade Adj	usunoni.	0.0
Ro	ad Elevation:	0.0 feet		Lane Ec	quivalent Dis	stance (ir	i feet)		
	Road Grade:	0.0%			Autos:	95.525			
	Left View:	-90.0 degree	es	Mediu	ım Trucks:	95.432			
	Right View:	90.0 degree	es	Hea	vy Trucks:	95.441			
FHWA Noise Mod	lel Calculation	15							
VehicleType	REMEL	Traffic Flow	Distanc	e Finite	e Road 🛛 🛛 F	resnel	Barrier Att	en Berr	n Atten
Autos:	74.55	3.36	-	4.32	-1.20	-4.77	· 0.0	000	0.000
Medium Trucks:	84.86	-16.00	-	4.31	-1.20	-4.88	0.0	000	0.000
Heavy Trucks:	88.18	-9.29	-	4.31	-1.20	-5.16	0.0	000	0.000
Unmitigated Nois	e Levels (with	nout Topo and	barrier at	tenuation)					
VehicleType	Leq Peak Ho	ur Leq Day	Lee	q Evening	Leq Nigi	ht	Ldn	CN	IEL
Autos:	72	2.4	70.5	68.7	,	62.7	71.3	3	71.9
Medium Trucks:	63	3.3	61.8	55.5	5	53.9	62.4	Ļ	62.6
Heavy Trucks:	73	3.4	72.0	62.9)	64.2	72.5	i	72.6
Vehicle Noise:	76	6.2	74.5	69.9)	66.7	75.2	2	75.5
Centerline Distan	ce to Noise C	ontour (in feet)						
				70 dBA	65 dBA	l i	60 dBA	55	dBA
			Ldn:	222	478		1,030	2,2	220
		CI	VEL:	234	503		1,085	2,3	336

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	FH	WA-RD-77-	108 HIG	HWAY	NOISE F	REDICTIC	N MODEI			
Scenai Road Nan Road Segme	rio: Year 2017 ne: I-215 SB F nt: s/o Harley	Without Pro wy Knox Bl.	oject			Project N Job Nu	lame: Kno mber: 934	x Business Pa 9	ark	
SITE	SPECIFIC II	NPUT DAT	A			NO	DISE MO	DEL INPUTS	5	
Highway Data					Site Co.	nditions (l	Hard = 10,	Soft = 15)		
Average Daily	Traffic (Adt):	47,400 ve	hicles				Auto	os: 15		
Peak Hour	Percentage:	10%			M	edium Truc	ks (2 Axle	s): 15		
Peak H	lour Volume:	4,740 veh	icles		H	eavy Truck	is (3+ Axle	s): 15		
Ve	hicle Speed:	65 mp	h		Vehicle	Mix				
Near/Far La	ne Distance:	60 fee			Ve	hicleType	Da	/ Evenina	Niaht	Dailv
Site Data						AL	itos: 77.	5% 12.9%	9.6%	93.82%
Ba	rrier Heiaht:	0.0 fe	et		N	1edium Tru	cks: 84.	8% 4.9%	10.3%	1.09%
Barrier Type (0-V	Vall, 1-Berm):	0.0				Heavy Tru	cks: 86.	5% 2.7%	10.8%	5.09%
Centerline Di	ist. to Barrier:	100.0 fee	et		Noise S	ource Ele	vations (ii	n feet)		
Centerline Dist.	to Observer:	100.0 fee	et			Autos	0.000			
Barrier Distance	to Observer:	0.0 fee	et		Medii	im Trucks:	2.297			
Observer Height	(Above Pad):	5.0 fee	et		Hea	vv Trucks:	8.004	Grade Adj	ustment:	0.0
P	ad Elevation:	0.0 fee	et							
Ro	ad Elevation:	0.0 fee	et		Lane Ed	quivalent l	Distance (in feet)		
	Road Grade:	0.0%				Autos:	95.525			
	Left View:	-90.0 de	grees		Mediu	Im Trucks:	95.432			
	Right View:	90.0 de	grees		Hea	vy Trucks:	95.441			
FHWA Noise Mod	lel Calculatior	15								
VehicleType	REMEL	Traffic Flo	w D	istance	Finite	e Road	Fresnel	Barrier Atte	en Berr	n Atten
Autos:	74.55	3	.05	-4.3	32	-1.20	-4.7	77 0.0	00	0.000
Medium Trucks:	84.86	i -16	.32	-4.3	31	-1.20	-4.8	38 0.0	00	0.000
Heavy Trucks:	88.18	-9	.61	-4.3	31	-1.20	-5.1	16 0.0	00	0.000
Unmitigated Nois	e Levels (with	nout Topo a	and barr	ier atte	nuation)					
VehicleType	Leq Peak Ho	ur Leq	Day	Leq E	Evening	Leq N	light	Ldn	CN	IEL
Autos:	72	2.1	70.2		68.4	1	62.4	71.0)	71.6
Medium Trucks:	63	3.0	61.5		55.2	2	53.6	62.1		62.3
Heavy Trucks:	73	3.1	71.6		62.6	6	63.9	72.2	2	72.3
Vehicle Noise:	75	5.8	74.2		69.6	6	66.4	74.9)	75.2
Centerline Distan	ce to Noise C	ontour (in a	feet)							
				70	dBA	65 di	BA	60 dBA	55	dBA
			Ldn:	2	211	455	5	981	2,1	14
			CNEL:	2	223	479	Ð	1,033	2,2	225

Road Name: I Road Segment: I Road Segment: I SITE SPH Highway Data Average Daily Trai Peak Hour Per Peak Hour Per Peak Hour Vehich Near/Far Lane I Site Data Barrier Tung (O.Wall	Inclate Soft of the second sec	y nox Bl. PUT DATA 14,700 vehicles 10% 4,470 vehicles 65 mph 60 feet		5	Site Cond Med Hea Vehicle M	Job Nun NO ditions (H dium Truck	ISE M ard = 1 A (s (2 A) (3+ A)	ODE 0, So utos: des):	L INPUT: <i>ft = 15)</i> 15 15	S	
Road Segment: r Road Segment: r SITE SPI Highway Data Average Daily Trai Peak Hour Per Peak Hour Peak Hour Peak Peak Peak Peak Peak Peak Peak Peak	r Height:	7 nox Bl. PUT DATA 14,700 vehicles 10% 4,470 vehicles 65 mph 60 feet		5	Site Cond Med Hea Vehicle N	NO ditions (H dium Truck	ISE M ard = 1 A ks (2 A) s (3+ A)	ODE 0, So utos: des):	L INPUT oft = 15) 15 15	S	
Highway Data Highway Data Average Daily Trai Peak Hour Per Peak Hour Ver Vehick Near/Far Lane D Site Data Barrier Tung (J.Wall	ECIFIC INF ffic (Adt): 4 rcentage: Volume: 4 e Speed: Distance: r Height:	PUT DATA 14,700 vehicles 10% 4,470 vehicles 65 mph 60 feet		5	Site Cond Med Hea Vehicle N	NO ditions (H dium Truck avy Trucks	ISE M ard = 1 A ks (2 A) s (3+ A)	ODE 0, So utos: (les):	L INPUT oft = 15) 15 15	S	
Highway Data Average Daily Trai Peak Hour Per Peak Hour Vehick Near/Far Lane I Site Data Barrier Barrier Type (/0,Wall	ffic (Adt): 4 rcentage: · Volume: 4 e Speed: Distance: r Height:	14,700 vehicles 10% 4,470 vehicles 65 mph 60 feet		5	Site Cond Med Hea Vehicle N	ditions (H dium Truck avy Trucks	ard = 1 A ks (2 A) ks (3+ A)	utos: des):	oft = 15) 15 15	-	
Average Daily Trai Peak Hour Per Peak Hour Vehick Near/Far Lane I Site Data Barrier Parrier Type (0;Wall	ffic (Adt): 4 rcentage: Volume: 4 e Speed: Distance: r Height:	14,700 vehicles 10% 4,470 vehicles 65 mph 60 feet		١	Mec Hea Vehicle N	dium Truck avy Trucks	A ks (2 A) k (3+ A)	utos: des):	15 15		
Peak Hour Per Peak Hour Vehick Near/Far Lane I Site Data Barrier Barrier Type (O-Wall	rcentage: Volume: e Speed: Distance: r Height:	10% 4,470 vehicles 65 mph 60 feet		١	Med Hea Vehicle N	dium Truck avy Trucks	ks (2 A) (3+ A)	des):	15		
Peak Hour Vehick Near/Far Lane I Site Data Barrier Barrier Type (/-Wall	Volume: 4 e Speed: Distance: r Height:	4,470 vehicles 65 mph 60 feet		١	Hea Vehicle N	avy Trucks	; (3+ A)				
Vehick Near/Far Lane L Site Data Barrier Barrier Type (/-Wall	e Speed: Distance: r Height:	65 mph 60 feet		١	Vehicle N			des):	15		
Near/Far Lane I Site Data Barrier Barrier Type (0-Wall	Distance: r Height:	60 feet		F		lix					
Site Data Barrier Barrier Type (0-Wall	r Height:				Vehi	cleTvpe	L	Dav	Evenina	Niaht	Dailv
Barrier	r Height:					Aut	os: 7	7.5%	12.9%	9.6%	93.829
Barrier Tyne (0-Wall	mongine	0.0 feet			Me	dium Truc	:ks: 8	4.8%	4.9%	10.3%	1.09%
Dunici Type (0 Wall.	1-Berm):	0.0			н	leavy Truc	:ks: 8	6.5%	2.7%	10.8%	5.09%
Centerline Dist. to	o Barrier:	100.0 feet			Noiso So	urco Elov	ations	(in fo	(of)		
Centerline Dist. to C	Observer:	100.0 feet			10/36 30	Autos:	0.00	10	el)		
Barrier Distance to C	Observer:	0.0 feet			Modiun	n Trucks	2.20	50 27			
Observer Height (Abc	ove Pad):	5.0 feet			Heav	v Trucks:	8.00	57 14	Grade Ad	iustment	0.0
Pad E	levation:	0.0 feet			,						
Road E	levation:	0.0 feet		L	Lane Equ	ivalent D	istance	e (in f	eet)		
Roa	d Grade:	0.0%				Autos:	95.5	25			
L	.eft View:	-90.0 degrees			Mediun	n Trucks:	95.4	32			
Rig	ght View:	90.0 degrees			Heavy	y Trucks:	95.4	41			
FHWA Noise Model C	alculations										
VehicleType F	REMEL	Traffic Flow	Distan	ice	Finite I	Road	Fresne	1	Barrier Att	en Ber	m Atten
Autos:	74.55	2.79		-4.32	2	-1.20	-	4.77	0.0	000	0.00
Medium Trucks:	84.86	-16.58		-4.31	1	-1.20	-	4.88	0.0	000	0.00
Heavy Trucks:	88.18	-9.86		-4.31	1	-1.20	-	5.16	0.0	000	0.00
Unmitigated Noise Le	evels (witho	ut Topo and ba	rrier a	tten	uation)						
VehicleType Leo	q Peak Hour	Leq Day	Le	eq Ev	vening	Leq Ni	ght		Ldn	C	VEL
Autos:	71.8	3 69.	9		68.2		62.1		70.7	7	71.
Medium Trucks:	62.8	3 61.	3		54.9		53.4		61.8	3	62.
Heavy Trucks:	72.8	3 71.	.4		62.3		63.6		72.0)	72.
Vehicle Noise:	75.6	6 74.	.0		69.3		66.2		74.6	5	75.
Centerline Distance to	o Noise Cor	ntour (in feet)	-	70 .	JD A	ee de	4	6	0 dBA	55	dD A
		اس ا		20	JDA 12	00 dB	м	6	044	25	022
		CNE	u. L -	20	13	430			002	2,	140

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL Scenario: Year 2017 Without Project Road Name: I-215 NB Fwy Project Name: Knox Business Park Job Number: 9349 Road Segment: s/o Harley Knox Bl. SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 34,900 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,490 vehicles Heavy Trucks (3+ Axles): 15 65 mph Vehicle Speed: Vehicle Mix Near/Far Lane Distance: 60 feet Day Evening Night Daily VehicleType Site Data Autos: 77.5% 12.9% 9.6% 93.82% Medium Trucks: 84.8% 4.9% 10.3% 1.09% Barrier Height: Barrier Type (0-Wall, 1-Berm): 0.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 5.09% 0.0 Centerline Dist. to Barrier: Centerline Dist. to Observer: 100.0 feet Noise Source Elevations (in feet) 100.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Grade Adjustment: 0.0 Heavy Trucks: 8.004 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Elevation: 0.0 feet Road Grade: Autos: 95.525 0.0% Medium Trucks: Left View: -90.0 degrees 95.432 Right View: Heavy Trucks: 95.441 90.0 degrees FHWA Noise Model Calculation VehicleType REMEL Autos: 74. Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten 74.55 1.72 -4.32 -1.20 -4.77 0.000 0.000 -17.65 -4.31 -1.20 Medium Trucks: 84.86 -4.88 0.000 0.000 Heavy Trucks: 88.18 -10.94 -4.31 -1.20 -5.16 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day 68.8 CNEL Leq Evening Leq Night Ldn Autos 70.7 67.1 61.0 69.6 Medium Trucks: 61.7 60.2 53.8 52.3 60.7 Heavy Trucks: 71.7 70.3 61.3 62.5 70.9 Vehicle Noise: 74.5 72.9 68.2 65.1 73.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 172 371 800 1,724 CNEL: 181 391 842 1,814

		NA-ND-11-100 HIN			LEDICHON	MODEL						
Scenar	rio: Year 2017	Without Project		Project Name: Knox Business Park								
Road Nan	ne: Harley Kno	ix Bl.		Job Number: 9349								
Road Segme	ent: e/o Harvill	Av.										
SITE	SPECIFIC IN	IPUT DATA		NOISE MODEL INPUTS								
Highway Data				Site Con	ditions (Ha	rd = 10, S	oft = 15)					
Average Daily	Traffic (Adt):	12,500 vehicles				Autos.	15					
Peak Hour	Percentage:	10%		Me	dium Trucks	(2 Axles)	: 15					
Peak H	Hour Volume:	1,250 vehicles		He	avy Trucks	(3+ Axles)	: 15					
Ve	ehicle Speed:	45 mph	-	Vehicle	Mix							
Near/Far La	ane Distance:	54 feet	-	Veh	icleType	Day	Evening	Night	Daily			
Site Data				-	Auto	s: 77.5%	6 12.9%	9.6%	93.82%			
Ba	nrier Height	0.0 feet		Me	edium Truck	s: 84.8%	6 4.9%	10.3%	1.09%			
Barrier Type (0-V	Vall, 1-Berm):	0.0		ŀ	Heavy Truck	s: 86.5%	6 2.7%	10.8%	5.09%			
Centerline D	ist. to Barrier:	100.0 feet	ŀ	Noise So	ource Eleva	tions (in f	eet)					
Centerline Dist.	to Observer:	100.0 feet	ŀ		Autos:	0.000						
Barrier Distance	to Observer:	0.0 feet		Mediu	m Trucks:	2.297						
Observer Height	(Above Pad):	5.0 feet		Heav	v Trucks:	8 004	Grade Ad	ustment.	0.0			
P	ad Elevation:	0.0 feet	-	mour	<i>y maono.</i>	0.001						
Ro	ad Elevation:	0.0 feet	-	Lane Eq	uivalent Dis	stance (in	feet)					
	Road Grade:	0.0%			Autos:	96.416						
	Left View:	-90.0 degrees		Mediui	m Trucks:	96.324						
	Right View:	90.0 degrees		Heav	ry Trucks:	96.333						
FHWA Noise Mod	lel Calculation	IS	1	-								
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road F	resnel	Barrier Att	en Ber	m Atten			
Autos:	68.46	-1.15	-4.3	8	-1.20	-4.77	0.0	000	0.000			
Medium Trucks:	79.45	-20.51	-4.3	57	-1.20	-4.88	0.0	000	0.000			
Heavy Trucks:	84.25	-13.80	-4.3	8	-1.20	-5.16	0.0	000	0.000			
Unmitigated Nois	e Levels (with	out Topo and bar	rrier atter	nuation)								
VehicleType	Leq Peak Ho	ur Leq Day	Leq E	vening	Leq Nigi	ht	Ldn	CI	VEL			
Autos:	61	.7 59.	8	58.1		52.0	60.6	6	61.2			
Medium Trucks:	53	3.4 51.9	9	45.5		43.9	52.4	ŀ	52.6			
Heavy Trucks:	64	.9 63.	5	54.4		55.7	64.0)	64.2			
Vehicle Noise:	66	6.8 65.3	2	59.8		57.4	65.9	,	66.1			
Centerline Distan	ce to Noise C	ontour (in feet)	70	-/0.4	05 -104		00-104		10.4			
		I de		aBA	65 dBA		DU OBA	55	aBA 20			
		CNEL	л. с . р)) 55	114		240	5	50			
		CINEL		10	119		201	5	55			

EUWA-PD-77-109 LICUWAY NOISE PREDICTION MODEL

Monday, June 08, 2015

Monday, June 08, 2015

Monday, June 08, 2015

0.000

70.2

61.0

71.0

73.9

	FH	WA-RD-77-10	8 HIGH	IWAY N	IOISE P	REDICTIC	ON MODE	EL					
Scenai Road Nan Road Segme	Scenario: Year 2017 Without Project Road Name: Harley Knox Bl. Road Segment: e/o I-215 SB Fwy Ramps					Project N Job Nu	lame: Kr mber: 93	nox Busines 149	ss Park				
SITE	SPECIFIC II	NPUT DATA			NOISE MODEL INPUTS								
Highway Data					Site Cor	nditions (l	Hard = 10	0, Soft = 15	5)				
Average Daily	Traffic (Adt):	22,000 vehic	les				AL	itos: 15					
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Ax	<i>les):</i> 15					
Peak H	lour Volume:	2,200 vehicl	es		He	avy Truck	is (3+ Ax	les): 15					
Ve	hicle Speed:	45 mph		-	Vehicle	Mix							
Near/Far La	ne Distance:	54 feet		-	Veh	nicleType	D	av Eveni	ina Ni	aht	Daily		
Site Data						AL	itos: 77	7.5% 12.9	9% 9	9.6%	93.82%		
Ba	rrier Height	0.0 feet			М	edium Tru	cks: 84	4.8% 4.9	9% 10	0.3%	1.09%		
Barrier Type (0-V	Vall, 1-Berm):	0.0				Heavy Tru	cks: 86	6.5% 2.7	7% 10	0.8%	5.09%		
Centerline Di	ist. to Barrier:	100.0 feet		1	Noise S	ource Ele	vations	(in feet)			-		
Centerline Dist.	to Observer:	100.0 feet		_		Autos	0.00	0					
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.29	7					
Observer Height	(Above Pad):	5.0 feet			Hea	v Trucks:	8.00	4 Grade	Adjusti	ment:	0.0		
P	ad Elevation:	0.0 feet		_					,				
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalent l	Distance	(in feet)					
	Road Grade:	0.0%				Autos:	96.41	6					
	Left View:	-90.0 degr	ees		Mediu	m Trucks:	96.32	:4					
	Right View:	90.0 degr	ees		Hear	vy Trucks:	96.33	3					
FHWA Noise Mod	lel Calculatior	15											
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresnel	Barrier	r Atten	Bern	n Atten		
Autos:	68.46	i 1.3	1	-4.38	3	-1.20	-4	1.77	0.000		0.000		
Medium Trucks:	79.45	-18.0	6	-4.37	7	-1.20	-4	1.88	0.000		0.000		
Heavy Trucks:	84.25	-11.3	4	-4.38	В	-1.20	-5	5.16	0.000		0.000		
Unmitigated Nois	e Levels (with	nout Topo an	d barrie	er atten	uation)								
VehicleType	Leq Peak Ho	ur Leq Da	ay 🛛	Leg Ev	vening	Leq N	light	Ldn		CN	EL		
Autos:	64	4.2	62.3		60.5		54.5		63.1		63.7		
Medium Trucks:	55	5.8	54.3		47.9		46.4		54.9		55.1		
Heavy Trucks:	67	7.3	65.9		56.9		58.1		66.5		66.6		
Vehicle Noise:	69	9.3	67.7		62.2		59.9		68.3		68.6		
Centerline Distan	ce to Noise C	ontour (in fee	et)			r							
				70 c	'BA	65 d	BA	60 dBA		55 d	1BA		
			Ldn:	7	7	166	6	359		77	'3		
		0	:NEL:	8	1	174	1	374		80)7		

	FUA	1A-KD-11-100	nigi			EDICI		DEL					
Scenario	: Year 2017 \	Nithout Project			Project Name: Knox Business Park								
Road Name	: Harley Knox	KBI.			Job Number: 9349								
Road Segment	: e/o I-215 N	B Fwy Ramps											
SITE S	PECIFIC IN	PUT DATA			NOISE MODEL INPUTS								
Highway Data				s	ite Con	ditions	(Hard =	10, So	oft = 15)				
Average Daily T	raffic (Adt):	31,000 vehicle	es					Autos:	15				
Peak Hour F	Percentage:	10%			Med	dium Tri	ucks (2)	Axles):	15				
Peak Ho	ur Volume:	3,100 vehicles	5		Hea	avy Truo	cks (3+)	Axles):	15				
Veh	icle Speed:	45 mph		V	ehicle N	lix							
Near/Far Lan	e Distance:	54 teet			Vehi	cleType	•	Day	Evening	Night	Daily		
Site Data						/	Autos:	77.5%	12.9%	9.6%	93.829		
Barr	ier Height:	0.0 feet			Me	dium Ti	rucks:	84.8%	4.9%	10.3%	1.09%		
Barrier Type (0-Wa	II, 1-Berm):	0.0			H	leavy Ti	rucks:	86.5%	2.7%	10.8%	5.09%		
Centerline Dist	. to Barrier:	100.0 feet		Δ	loise So	urce El	levation	s (in fe	et)				
Centerline Dist. to	Observer:	100.0 feet				Auto	s: 0.	000					
Barrier Distance to	Observer:	0.0 feet			Mediun	n Truck	s: 2.	297					
Observer Height (A	bove Pad):	5.0 feet			Heav	y Truck	s: 8.	004	Grade Ad	justment	: 0.0		
Pad	d Elevation:	0.0 feet			ana Eau	dualan	Distan	ee (in	fa a 4)				
Road	1 Elevation:	0.0 feet		-	ane Equ	Auto	Distan	446	ieel)				
R	oad Grade:	0.0%			Modium	AUIO n Truck	s. 90. o: 06	224					
	Left View.	-90.0 degree	:5		Hoav	v Truck	s. 50. e 96	324					
	light view.	50.0 degree			nour,	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	5. 00.	000					
FHWA Noise Model	Calculation	s											
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresr	nel	Barrier Att	en Ber	m Atten		
Autos:	68.46	2.80		-4.38		-1.20		-4.77	0.0	000	0.00		
Medium Trucks:	79.45	-16.57		-4.37		-1.20		-4.88	0.0	000	0.00		
Heavy Trucks:	84.25	-9.86		-4.38		-1.20		-5.16	0.0	000	0.00		
Unmitigated Noise	Levels (with	out Topo and	barrie	er atteni	lation)								
VehicleType L	.eq Peak Hou	r Leq Day	r	Leq Ev	ening	Leq	Night		Ldn	C	NEL		
Autos:	65.	.7	63.8		62.0		56.0)	64.6	6	65.		
Medium Trucks:	57.	.3	55.8		49.4		47.9	9	56.4	4	56.		
Heavy Trucks:	68.	.8	67.4		58.4		59.6	5	68.0)	68.		
Vehicle Noise:	70	.7	69.2		63.7		61.4	4	69.8	3	70.		
Centerline Distance	e to Noise Co	ontour (in feet,)										
			L	70 d	BA	65	dBA	6	60 dBA	55	dBA		
			Ldn:	97		2	09		451	ę	971		
		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~		10		~	10		474	1	014		

	FH	WA-RD-77-108	HIGHW	AY NC	DISE PI	REDICTIO	N MODE	L					
Scenario Road Name Road Segmen	o: Year 2017 e: Oleander / nt: e/o Drivew	Without Projec Av. ay 6	t			Project N Job Nur	ame: Kn nber: 93-	ox Business P 49	lark				
SITE S	SPECIFIC II	NPUT DATA			NOISE MODEL INPUTS								
Highway Data				Si	te Cor	ditions (H	lard = 10), Soft = 15)					
Average Daily	Traffic (Adt):	100 vehic	es				Au	tos: 15					
Peak Hour I	Percentage:	10%			Me	dium Truc	ks (2 Axl	es): 15					
Peak Ho	our Volume:	10 vehicle	s		He	avy Truck	s (3+ Axl	es): 15					
Vet	nicle Speed:	40 mph		V	hicle	Mix							
Near/Far Lar	ne Distance:	36 feet		-	Veh	icleType	De	v Evenina	Night Daily				
Site Data						Au	tos: 77	.5% 12.9%	9.6% 93.82%				
Bar	rier Height	0.0 feet			М	edium Tru	cks: 84	.8% 4.9%	10.3% 1.09%				
Barrier Type (0-Wa	all, 1-Berm):	0.0			1	Heavy Tru	cks: 86	.5% 2.7%	10.8% 5.09%				
Centerline Dis	t. to Barrier:	100.0 feet		N	oise Se	ource Elev	ations (in feet)					
Centerline Dist. t	o Observer:	100.0 feet				Autos	0.000)					
Barrier Distance t	o Observer:	0.0 feet			Mediu	m Trucks:	2.29	7					
Observer Height (/	Above Pad):	5.0 feet			Heat	N Trucks:	8.004	1 Grade Ad	iustment: 0.0				
Pa	d Elevation:	0.0 feet		_									
Roa	d Elevation:	0.0 feet		Lá	ane Eq	uivalent L	istance	(in feet)					
F	Road Grade:	0.0%				Autos:	98.49	4					
	Left View:	-90.0 degre	es		Mediu	m Trucks:	98.404	4					
	Right View:	90.0 degre	es		Heav	/y Trucks:	98.413	3					
FHWA Noise Mode	el Calculation	ıs											
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresnel	Barrier Att	en Berm Atten				
Autos:	66.51	-21.60		-4.52		-1.20	-4.	77 0.0	000.00				
Medium Trucks:	77.72	-40.97		-4.51		-1.20	-4.	88 0.0	000.00				
Heavy Trucks:	82.99	-34.26		-4.51		-1.20	-5.	16 0.0	00.00				
Unmitigated Noise	Levels (with	nout Topo and	barrier	attenu	ation)								
VehicleType	Leq Peak Ho	ur Leq Da	/ L	eq Eve	ening	Leq Ni	ght	Ldn	CNEL				
Autos:	39	9.2	37.3		35.5		29.5	38.	1 38.3				
Medium Trucks:	31	1.0	29.5		23.2		21.6	30.	1 30.3				
Heavy Trucks:	43	3.0	41.6		32.6		33.8	42.3	2 42.3				
Vehicle Noise:	44	4.7	43.2		37.5		35.4	43.	8 44.				
Centerline Distanc	e to Noise C	ontour (in fee)	70.1		05 "		60 - ID 4	55 - ID (
			L	7U dE	5/4	65 dE	54	oU dBA	55 dBA				
		0	Lan:	2		4		ŏ	18				
		L L	NEL:	2		4		а	19				

	FH	WA-RD-77-10	3 HIGH	WAY N	OISE PI	REDICTI	ON MO	DEL								
Scenar Road Nan Road Segme	Scenario: Year 2017 Without Project Road Name: Oleander Av. Road Segment: w/o Harvill Av.						Project Name: Knox Business Park Job Number: 9349									
SITE	SPECIFIC II	NPUT DATA				N	OISE I	NODE	EL INPUT	s						
Highway Data				5	Site Con	ditions	(Hard =	10, S	oft = 15)							
Average Daily	Traffic (Adt):	500 vehic	les					Autos	: 15							
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 /	Axles)	: 15							
Peak H	lour Volume:	50 vehicle	es		He	avy Truc	cks (3+ /	Axles)	: 15							
Ve	hicle Speed:	40 mph		1	/ehicle	Mix										
Near/Far La	ne Distance:	36 feet			Veh	icleTvpe		Dav	Evenina	Niahi	Dailv					
Site Data						A	Autos:	77.5%	6 12.9%	9.6	% 93.82%					
Ba	rrier Heiaht:	0.0 feet			M	edium Tr	ucks:	84.8%	6 4.9%	10.3	% 1.09%					
Barrier Type (0-W	/all, 1-Berm):	0.0			1	Heavy Tr	ucks:	86.5%	6 2.7%	10.8	% 5.09%					
Centerline Di	st. to Barrier:	100.0 feet			Voise Sr	ource Fl	evation	s (in f	feet)							
Centerline Dist.	to Observer:	100.0 feet		-		Autos	s: 0	000	,		-					
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks	s: 2.	297								
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks	s: 8.0	004	Grade Ad	justme	nt: 0.0					
P	ad Elevation:	0.0 feet		-												
Ro	ad Elevation:	0.0 feet		1	.ane Eq	uivalent	Distan	ce (in	feet)							
	Road Grade:	0.0%				Autos	s: 98.	494								
	Left View:	-90.0 degre	es		Mediu	m Trucks	s: 98.	404								
	Right View:	90.0 degre	es		Heav	y Trucks	s: 98.	413								
FHWA Noise Mod	el Calculation	15														
VehicleType	REMEL	Traffic Flow	Disi	tance	Finite	Road	Fresr	nel	Barrier Att	en E	erm Atten					
Autos:	66.51	-14.61		-4.52	2	-1.20		-4.77	0.0	000	0.000					
Medium Trucks:	77.72	-33.98		-4.51		-1.20		-4.88	0.0	000	0.000					
Heavy Trucks:	82.99	-27.27		-4.51		-1.20		-5.16	0.0	000	0.000					
Unmitigated Nois	e Levels (with	hout Topo and	l barrie	er atten	uation)											
VehicleType	Leq Peak Ho	ur Leq Da	у	Leq Ev	ening/	Leq	Night		Ldn		CNEL					
Autos:	46	6.2	44.3		42.5		36.5	5	45.1	1	45.7					
Medium Trucks:	38	B.0	36.5		30.2		28.6	6	37.1	1	37.3					
Heavy Trucks:	50	0.0	48.6		39.6		40.8	3	49.2	2	49.3					
Vehicle Noise:	5	1.7	50.2		44.5		42.4	1	50.8	3	51.0					
Centerline Distan	ce to Noise C	ontour (in fee	t)													
				70 a	<i>IBA</i>	65 (dBA		60 dBA	1	55 dBA					
			Ldn:	5		1	1		24		52					
		C	NEL:	5		1	2		25		55					

Monday, June 08, 2015

	FH	WA-RD-77-10	B HIGH	WAY NO	OISE P	REDICTIO	N MODEI						
Scenar Road Nan Road Segme	Scenario: Year 2017 With Project Road Name: Harvill Av. Road Segment: s/o Harley Knox Bl.				Project Name: Knox Business Park Job Number: 9349								
SITE	SPECIFIC I	IPUT DATA			NOISE MODEL INPUTS								
Highway Data				S	lite Cor	nditions (H	lard = 10,	Soft = 15)					
Average Daily	Traffic (Adt):	13,713 vehic	es				Auto	os: 15					
Peak Hour	Percentage:	10%			Me	edium Truc	ks (2 Axle	s): 15					
Peak H	lour Volume:	1,371 vehicle	s		He	eavy Truck	s (3+ Axle	s): 15					
Ve	hicle Speed:	50 mph		V	ahicla	Mix							
Near/Far La	ne Distance:	48 feet		-	Veh	nicleType	Da	/ Evening	Night Daily				
Site Data						Au	itos: 77.	5% 12.9%	9.6% 89.06%				
Ba	rrier Heiaht:	0.0 feet			М	ledium Tru	cks: 84.	8% 4.9%	10.3% 2.17%				
Barrier Type (0-W	/all, 1-Berm):	0.0			1	Heavy Tru	cks: 86.	5% 2.7%	10.8% 8.78%				
Centerline Di	st. to Barrier:	100.0 feet		N	loise S	ource Elev	vations (ii	n feet)					
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.000						
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2 297						
Observer Height	(Above Pad):	5.0 feet			Hear	w Trucks:	8 004	Grade Adi	ustment: 0.0				
P	ad Elevation:	0.0 feet			mou	ry maono.	0.001						
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent L	Distance (in feet)					
	Road Grade:	0.0%				Autos:	97.206						
	Left View:	-90.0 degre	es		Mediu	m Trucks:	97.115						
	Right View:	90.0 degre	es		Hear	vy Trucks:	97.124						
FHWA Noise Mod	el Calculation	IS											
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresnel	Barrier Atte	en Berm Atten				
Autos:	70.20	-1.43		-4.43		-1.20	-4.7	77 0.0	00 0.000				
Medium Trucks:	81.00	-17.56		-4.43		-1.20	-4.8	38 0.0	00 0.000				
Heavy Trucks:	85.38	-11.49		-4.43		-1.20	-5.1	16 0.0	00 0.000				
Unmitigated Nois	e Levels (with	out Topo and	barrie	r attenu	uation)								
VehicleType	Leq Peak Ho	ur Leq Da	y	Leg Ev	ening	Leq N	ight	Ldn	CNEL				
Autos:	63	3.1	61.2		59.5		53.4	62.0	62.7				
Medium Trucks:	57	⁷ .8	56.3		49.9		48.4	56.9	57.1				
Heavy Trucks:	68	3.3	66.8		57.8		59.1	67.4	67.5				
Vehicle Noise:	69	9.7	68.2		62.0		60.4	68.8	69.0				
Centerline Distan	ce to Noise C	ontour (in fee	t)										
			L	70 di	BA	65 dE	BA	60 dBA	55 dBA				
			Ldn:	83	3	179)	386	832				
		C	NEL:	86	6	186	6	401	863				

	FRV	A-RD-77-106 HIC	HWAT	NUISE PR	EDICTIO		=L					
Scenario	p: Year 2017 \	Vith Project			Project Na	me: Kr	nox Business	Park				
Road Name	e: Harvill Av.			Job Number: 9349								
Road Segmen	t: n/o Oleande	er Av.										
SITE S	SPECIFIC IN	PUT DATA		NOISE MODEL INPUTS								
Highway Data				Site Con	ditions (H	ard = 1	0, Soft = 15)					
Average Daily	Traffic (Adt):	13,513 vehicles				AL	itos: 15					
Peak Hour I	Percentage:	10%		Me	dium Truck	s (2 Ax	<i>les):</i> 15					
Peak He	our Volume:	1,351 vehicles		He	avy Trucks	(3+ Ax	<i>les):</i> 15					
Vel	nicle Speed:	50 mph	ŀ	Vehicle I	Nix							
Near/Far Lar	e Distance:	48 feet	-	Veh	cleType	D	ay Evenin	g Night	Daily			
Site Data					Aut	os: 7	7.5% 12.9	% 9.6%	6 88.99			
Bar	rier Heiaht:	0.0 feet		Me	edium Truc	ks: 84	4.8% 4.99	% 10.3%	6 2.189			
Barrier Type (0-Wa	all, 1-Berm):	0.0		ŀ	leavy Truc	ks: 81	6.5% 2.79	% 10.8%	6 8.839			
Centerline Dis	t. to Barrier:	100.0 feet	ł	Noise Sc	urco Elev	ations	(in feet)					
Centerline Dist. t	o Observer:	100.0 feet	ŀ	110/30 00	Autos:	0.00	0					
Barrier Distance t	o Observer:	0.0 feet		Mediur	n Trucks:	2 29	7					
Observer Height (/	Above Pad):	5.0 feet		Heav	v Trucks:	8.00	4. Grade	Adiustmer	t: 0.0			
Pa	d Elevation:	0.0 feet		mour	y maono.	0.00						
Roa	d Elevation:	0.0 feet		Lane Eq	uivalent D	stance	(in feet)					
F	Road Grade:	0.0%			Autos:	97.20	6					
	Left View:	-90.0 degrees		Mediur	n Trucks:	97.11	5					
	Right View:	90.0 degrees		Heav	y Trucks:	97.12	4					
FHWA Noise Mode	l Calculation	5										
VehicleType	REMEL	Traffic Flow D	Distance	Finite	Road	Fresne	Barrier	Atten Be	erm Atter			
Autos:	70.20	-1.49	-4.4	13	-1.20	-4	.77	0.000	0.00			
Medium Trucks:	81.00	-17.60	-4.4	13	-1.20	-4	.88	0.000	0.00			
Heavy Trucks:	85.38	-11.53	-4.4	13	-1.20	-5	. 16	0.000	0.00			
Unmitigated Noise	Levels (with	out Topo and bar	rier attei	nuation)								
VehicleType	Leq Peak Hou	r Leq Day	Leq E	vening	Leq Nig	tht	Ldn	(ONEL			
Autos:	63.	1 61.2	2	59.4		53.4	6	2.0	62.			
Medium Trucks:	57.	8 56.3	3	49.9		48.4	5	6.8	57.			
Heavy Trucks:	68.	2 66.8	3	57.8		59.0	6	7.4	67.			
Vehicle Noise:	69.	7 68.1	1	62.0		60.3	6	8.8	69.			
Centerline Distanc	e to Noise Co	ntour (in feet)	70	dBA	65 dB	4	60 dBA	5	5 dBA			
		I da		22	178	•	384	5	827			
				36	1/0		304		857			
		UNLL			105		390		007			

	FH\	WA-RD-77-108	B HIGH	WAY N	OISE P	REDICT	ION MO	DEL						
Scenar Road Nan Road Segme	io: Year 2017 ne: Harvill Av. nt: s/o Oleand	With Project er Av.				Project Job N	Name: umber:	Knox E 9349	Business P	'ark				
SITE	SPECIFIC IN	IPUT DATA			NOISE MODEL INPUTS									
Highway Data				S	Site Cor	nditions	(Hard =	10, Sc	oft = 15)					
Average Daily	Traffic (Adt):	11,202 vehic	es					Autos:	15					
Peak Hour	Percentage:	10%			Me	edium Tri	ucks (2 /	Axles):	15					
Peak F	lour Volume:	1,120 vehicle	s		He	eavy Truc	cks (3+ /	Axles):	15					
Ve	hicle Speed:	50 mph		V	/ehicle	Mix								
Near/Far La	ne Distance:	48 feet			Veh	icleType		Day	Evening	Night	Daily			
Site Data							Autos:	77.5%	12.9%	9.6%	93.63%			
Ba	rrier Heiaht:	0.0 feet			М	edium Ti	rucks:	84.8%	4.9%	10.3%	1.13%			
Barrier Type (0-W	/all, 1-Berm):	0.0				Heavy Ti	rucks:	86.5%	2.7%	10.8%	5.24%			
Centerline Di	st. to Barrier:	100.0 feet		٨	loise S	ource El	evation	s (in fe	eet)					
Centerline Dist.	to Observer:	100.0 feet				Auto	s: 0.	000						
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck	s: 2.	297						
Observer Height	(Above Pad):	5.0 feet			Hear	vy Truck	s: 8.	004	Grade Ad	justmen	t: 0.0			
P	ad Elevation:	0.0 feet					Distant	()	641					
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivaiem	Distan	ce (In i	reet)					
	Road Grade:	0.0%			Marth	Auto	s: 97.	206						
	Left View:	-90.0 degre	es		wealu	m Truck	5: 97.	115						
	Right View:	90.0 degre	es		Hear	vy Truck	s: 97.	124						
FHWA Noise Mod	el Calculation	s												
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresr	nel	Barrier Att	en Be	rm Atten			
Autos:	70.20	-2.09		-4.43	1	-1.20		-4.77	0.0	000	0.000			
Medium Trucks:	81.00	-21.25		-4.43	5	-1.20		-4.88	0.0	000	0.000			
Heavy Trucks:	85.38	-14.61		-4.43		-1.20		-5.16	0.0	000	0.000			
Unmitigated Nois	e Levels (with	out Topo and	barrie	er atteni	uation)									
VehicleType	Leg Peak Hou	ır Leq Da	y	Leq Ev	rening	Leq	Night		Ldn	C	NEL			
Autos:	62	.5	60.6		58.8		52.8	3	61.4	4	62.0			
Medium Trucks:	54	.1	52.6		46.3		44.7	7	53.3	2	53.4			
Heavy Trucks:	65	.1	63.7 65.7		54.7 60.4		55.9)	64.3	3	64.4			
Centerline Distan	ce to Noisc C		f)		00.4		57.3		50.	-	00.0			
Contenine Distan	00 10 MOI38 CI	un lee	<i>y</i>	70 d	BA	65	dBA	6	0 dBA	55	5 dBA			
			Ldn:	57	7	1:	22		263		567			
		С	NEL:	59	9	1:	28		275	ę	593			

	FH	WA-RD-77-108	B HIGHW	AY NO	DISE P	REDICTIO	ON MODEL					
Scena	rio: Year 2017	With Project			Project Name: Knox Business Park							
Road Nar	me: I-215 SB F	wy				Job Nu	mber: 934	9				
Road Segme	ent: n/o Harley	Knox Bl.										
SITE	SPECIFIC II	NPUT DATA				N	DISE MOI	DEL INPUT	s			
Highway Data				S	ite Cor	nditions (Hard = 10,	Soft = 15)				
Average Daily	/ Traffic (Adt):	51,000 vehic	es				Auto	os: 15				
Peak Hou	r Percentage:	10%			Me	edium True	cks (2 Axle	s): 15				
Peak	Hour Volume:	5,100 vehicle	s		He	avy Truck	ks (3+ Axle	s): 15				
V	ehicle Speed:	65 mph		V	ehicle	Mix				-		
Near/Far L	ane Distance:	60 feet		E	Veł	nicleTvpe	Dav	/ Evenina	Niaht	Dailv		
Site Data						A	utos: 77.	5% 12.9%	9.6%	6 93.82%		
Bi	arrier Height:	0.0 feet			М	ledium Tru	icks: 84.	8% 4.9%	10.3%	6 1.09%		
Barrier Type (0-V	Nall, 1-Berm):	0.0				Heavy Tru	icks: 86.	5% 2.7%	10.8%	6 5.09%		
Centerline D	oist. to Barrier:	100.0 feet		N	loise S	ource Ele	vations (ii	1 feet)		-		
Centerline Dist	to Observer:	100.0 feet				Autos	0.000					
Barrier Distance	e to Observer:	0.0 feet			Mediu	m Trucks	2.297					
Observer Height	(Above Pad):	5.0 feet			Heat	w Trucks	8 004	Grade Ad	iustmen	nt: 0.0		
F	Pad Elevation:	0.0 feet				.,						
Ro	oad Elevation:	0.0 feet		L	ane Eq	uivalent	Distance (in feet)				
	Road Grade:	0.0%				Autos:	95.525					
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.432					
	Right View:	90.0 degre	es		Hear	vy Trucks:	95.441					
FHWA Noise Mod	del Calculation	15								-		
VehicleType	REMEL	Traffic Flow	Distar	nce	Finite	Road	Fresnel	Barrier Att	en Be	erm Atten		
Autos	: 74.55	3.36		-4.32		-1.20	-4.7	7 0.0	000	0.000		
Medium Trucks	: 84.86	-16.00		-4.31		-1.20	-4.8	38 0.0	000	0.000		
Heavy Trucks	: 88.18	-9.29		-4.31		-1.20	-5.1	16 0.0)00	0.000		
Unmitigated Nois	se Levels (with	nout Topo and	barrier a	attenu	ation)					-		
VehicleType	Leq Peak Ho	ur Leq Da	V L	eq Eve	ening	Leq N	light	Ldn	0	ONEL		
Autos	: 72	2.4	70.5		68.7		62.7	71.3	3	71.9		
Medium Trucks	: 63	3.3	61.8		55.5		53.9	62.4	1	62.6		
Heavy Trucks	: 7:	3.4	72.0		62.9		64.2	72.5	i	72.6		
Vehicle Noise	. 70	6.2	74.5		69.9		66.7	75.2	2	75.5		
Centerline Distar	nce to Noise C	ontour (in fee	t)									
		-		70 dl	BA	65 d	BA	60 dBA	5	5 dBA		
			Ldn:	222	2	47	8	1,030	2	2,220		
		C	NEL:	234	1	50	3	1,085	2	2,336		

Monday, June 08, 2015

Monday, June 08, 2015
	FH	WA-RD-77-10		AY NO	DISE P	REDICTIO			_	
Scenar Road Nan Road Segme	io: Year 2017 ne: I-215 SB F nt: s/o Harley	With Project wy Knox Bl.				Project N Job Nur	lame: Kno nber: 934	x Business P 9	Park	
SITE	SPECIFIC IN	NPUT DATA				NC	ISE MO	DEL INPUT	S	
Highway Data				S	ite Cor	nditions (H	lard = 10,	Soft = 15)		
Average Daily	Traffic (Adt):	47,823 vehic	es				Auto	os: 15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Axle	s): 15		
Peak H	lour Volume:	4,782 vehicle	s		He	avy Truck	s (3+ Axle	s): 15		
Ve	hicle Speed:	65 mph		v	ehicle	Mix				
Near/Far La	ne Distance:	60 feet		-	Veh	nicleTvpe	Da	/ Evenina	Niah	t Dailv
Site Data						Au	tos: 77.	5% 12.9%	9.6	% 93.54%
Ba	rrier Height:	0.0 feet			М	edium Tru	cks: 84.	8% 4.9%	10.3	% 1.15%
Barrier Type (0-W	/all, 1-Berm):	0.0				Heavy Tru	cks: 86.	5% 2.7%	10.8	% 5.31%
Centerline Di	st. to Barrier:	100.0 feet		N	oise S	ource Elev	vations (ii	1 feet)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.297			
Observer Height	(Above Pad):	5.0 feet			Hea	v Trucks:	8.004	Grade Ad	ljustme	ent: 0.0
P	ad Elevation:	0.0 feet		-					, 	
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent L	Distance (in feet)		
	Road Grade:	0.0%				Autos:	95.525			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.432			
	Right View:	90.0 degre	es		Hear	vy Trucks:	95.441			
FHWA Noise Mod	el Calculation	IS								
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresnel	Barrier Att	ten E	Berm Atten
Autos:	74.55	3.07		-4.32		-1.20	-4.7	7 0.0	000	0.000
Medium Trucks:	84.86	-16.03		-4.31		-1.20	-4.8	38 0.0	000	0.000
Heavy Trucks:	88.18	-9.39		-4.31		-1.20	-5.1	6 0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	l barrier	attenu	ation)					
VehicleType	Leq Peak Ho	ur Leq Da	y L	.eq Ev	ening	Leq N	ight	Ldn		CNEL
Autos:	72	2.1	70.2		68.4		62.4	71.0	0	71.6
Medium Trucks:	63	3.3	61.8		55.4		53.9	62.4	4	62.6
Heavy Trucks:	73	3.3	71.9		62.8		64.1	72.4	4	72.6
Vehicle Noise:	76	3.0	74.4		69.7		66.6	75.	0	75.4
Centerline Distan	ce to Noise C	ontour (in fee	t)		_			-		-
			L	70 di	BA	65 dE	BA	60 dBA		55 dBA
			Ldn:	216	5 -	466		1,004		2,162
	CNEL:			227	227 490 1,055 2,27					2,274

	FH	WA-RD-77-106				EDICTIO	NWOL	EL			
Scenari	o: Year 2017	With Project			F	Project Na	ame: K	inox E	Business P	ark	
Road Nam	e: I-215 NB F	wy				Job Nun	nber: 9	349			
Road Segmer	nt: n/o Harley	Knox Bl.									
SITE	SPECIFIC IN	IPUT DATA				NO	ISE M	ODE	L INPUT	S	
Highway Data				Si	te Cond	litions (H	lard = 1	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	45,853 vehicle	S				A	utos:	15		
Peak Hour	Percentage:	10%			Med	ium Trucł	ks (2 A.	xles):	15		
Peak H	our Volume:	4,585 vehicles			Hea	vy Trucks	s (3+ A.	xles):	15		
Ve	hicle Speed:	65 mph		Ve	ehicle M	ix					
Near/Far Lai	ne Distance:	60 feet			Vehic	leType	L	Day	Evening	Night	Daily
Site Data						Aut	tos: 7	7.5%	12.9%	9.6%	92.75
Bar	rier Heiaht:	0.0 feet			Med	dium Truc	cks: 8	34.8%	4.9%	10.3%	1.339
Barrier Type (0-W	all, 1-Berm):	0.0			He	eavy Truc	cks: 8	86.5%	2.7%	10.8%	5.929
Centerline Dis	st. to Barrier:	100.0 feet		N	nisa Sai	irce Elev	ations	(in fe	of)		
Centerline Dist.	to Observer:	100.0 feet			0.00 000	Autos:	0.0	00	,01)		
Barrier Distance	to Observer:	0.0 feet			Medium	Trucks:	2.2	97			
Observer Height (Above Pad):	5.0 feet			Heavy	Trucks:	8.0	04	Grade Ad	iustment	0.0
Pa	ad Elevation:	0.0 feet			moury	maono.	0.0	0.			
Roa	ad Elevation:	0.0 feet		Lá	ane Equ	ivalent D	listanc	e (in i	feet)		
F	Road Grade:	0.0%				Autos:	95.5	25			
	Left View:	-90.0 degree	s		Medium	Trucks:	95.4	32			
	Right View:	90.0 degree	S		Heavy	Trucks:	95.4	41			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Distan	ice	Finite F	Road	Fresne	el	Barrier Att	en Ber	m Atter
Autos:	74.55	2.85		-4.32		-1.20	-	4.77	0.0	000	0.00
Medium Trucks:	84.86	-15.59		-4.31		-1.20	-	4.88	0.0	000	0.00
Heavy Trucks:	88.18	-9.09		-4.31		-1.20	-	5.16	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and I	oarrier a	ttenu	ation)						
VehicleType	Leq Peak Hou	ır Leq Day	Le	eq Eve	ening	Leq Ni	ght		Ldn	C	NEL
Autos:	71	.9 7	0.0		68.2		62.2		70.8	3	71.
Medium Trucks:	63	.8 6	2.3		55.9		54.3		62.8	5	63.
Heavy Trucks:	73	.6 7	2.2		63.1		64.4		72.1	(72.
Vehicle Noise:	76	.1 7	4.5		69.6		66.7		75.1		75.
Centerline Distance	ce to Noise C	ontour (in feet)		70 dE	24	65 d¤	24	6	0 dBA	55	dBA
		,	dn:	220		473	6.1	C	1 020	2	107
		CN	El·	220		4/3			1,020	2,	306
		0/1		201		437			1,070	۷.	000

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL Scenario: Year 2017 With Project Road Name: I-215 NB Fwy Project Name: Knox Business Park Job Number: 9349 Road Segment: s/o Harley Knox Bl. SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 34,900 vehicles Peak Hour Percentage: 10% Autos: 15 Medium Trucks (2 Axles): 15 Peak Hour Volume: 3,490 vehicles Heavy Trucks (3+ Axles): 15 65 mph Vehicle Speed: Vehicle Mix Near/Far Lane Distance: 60 feet Day Evening Night Daily VehicleType Site Data Autos: 77.5% 12.9% 9.6% 93.82% Medium Trucks: 84.8% 4.9% 10.3% 1.09% Barrier Height: Barrier Type (0-Wall, 1-Berm): 0.0 feet Heavy Trucks: 86.5% 2.7% 10.8% 5.09% 0.0 Centerline Dist. to Barrier: Centerline Dist. to Observer: 100.0 feet Noise Source Elevations (in feet) 100.0 feet Autos: 0.000 Barrier Distance to Observer: 0.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Grade Adjustment: 0.0 Heavy Trucks: 8.004 Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Elevation: 0.0 feet Road Grade: Autos: 95.525 0.0% Medium Trucks: Left View: -90.0 degrees 95.432 Right View: Heavy Trucks: 95.441 90.0 degrees FHWA Noise Model Calculation VehicleType REMEL Autos: 74. Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm Atten 74.55 1.72 -4.32 -1.20 -4.77 0.000 0.000 -17.65 -4.31 -1.20 Medium Trucks: 84.86 -4.88 0.000 0.000 Heavy Trucks: 88.18 -10.94 -4.31 -1.20 -5.16 0.000 0.000 Unmitigated Noise Levels (without Topo and barrier attenuation) Leq Day 68.8 CNEL VehicleType Leq Peak Hour Leq Evening Leq Night Ldn Autos 70.7 67.1 61.0 69.6 70.2 Medium Trucks: 61.7 60.2 53.8 52.3 60.7 61.0 Heavy Trucks: 71.7 70.3 61.3 62.5 70.9 71.0 Vehicle Noise: 74.5 72.9 68.2 65.1 73.5 73.9 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA Ldn: 172 371 800 1,724 CNEL: 181 391 842 1,814

	FHV	VA-RD-77-108	HIGHW	AY N	OISE PF	REDICT		DEL			
Scenario:	Year 2017	With Project				Project	Name:	Knox E	Business F	ark	
Road Name:	Harley Kno:	x Bl.				Job Ni	umber:	9349			
Road Segment:	e/o Harvill A	Av.									
SITE SF	PECIFIC IN	IPUT DATA				N	OISE	MODE	L INPUT	S	
Highway Data				S	Site Con	ditions	(Hard =	= 10, Se	oft = 15)		
Average Daily Tra	affic (Adt):	14,313 vehicle	s					Autos:	15		
Peak Hour Pe	ercentage:	10%			Me	dium Tru	ıcks (2	Axles):	15		
Peak Hou	ır Volume:	1,431 vehicles	6		He	avy Truc	:ks (3+	Axles):	15		
Vehic	cle Speed:	45 mph		v	ehicle l	Mix					
Near/Far Lane	Distance:	54 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						A	utos:	77.5%	12.9%	9.6%	89.26%
Barrie	er Heiaht:	0.0 feet			Me	edium Tr	ucks:	84.8%	4.9%	10.3%	2.12%
Barrier Type (0-Wall	l, 1-Berm):	0.0			ŀ	leavy Tr	ucks:	86.5%	2.7%	10.8%	8.62%
Centerline Dist.	to Barrier:	100.0 feet			loise Sc	urce El	evatio	ns (in fi	eet)		
Centerline Dist. to	Observer:	100.0 feet		-		Autos	. 0	000			
Barrier Distance to	Observer:	0.0 feet			Mediur	n Trucks	s. 0	.297			
Observer Height (Ab	oove Pad):	5.0 feet			Heav	v Trucks	. –	.004	Grade Ad	justment	: 0.0
Pad	Elevation:	0.0 feet		-							
Road	Elevation:	0.0 feet		L	ane Eq	uivalent	Distar	nce (in	feet)		
Ro	ad Grade:	0.0%				Autos	s: 96	.416			
_	Left View:	-90.0 degree	es		Mediur	n Trucks	s: 96	.324			
K	light View:	90.0 degree	es		Heav	y Trucks	s: 96	.333			
FHWA Noise Model	Calculation	s									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fres	nel	Barrier At	ten Bei	rm Atten
Autos:	68.46	-0.77		-4.38		-1.20		-4.77	0.0	000	0.000
Medium Trucks:	79.45	-17.01		-4.37		-1.20		-4.88	0.	000	0.000
Heavy Trucks:	84.25	-10.92		-4.38		-1.20		-5.16	0.0	000	0.000
Unmitigated Noise L	evels (with	out Topo and	barrier	attenu	uation)						
VehicleType Le	eq Peak Hou	ır Leq Day	L	.eq Ev	ening	Leq I	Night		Ldn	С	NEL
Autos:	62	.1	60.2		58.4		52.	4	61.	0	61.6
Medium Trucks:	56	.9	55.4		49.0		47.	4	55.	9	56.1
Heavy Trucks:	67	.8	6.3		57.3		58.	5	66.	9	67.0
Vehicle Noise:	69	.1	67.5		61.2		59.	.8	68.	2	68.4
Centerline Distance	to Noise Co	ontour (in feet)	-		-					
				70 d	BA	65 0	dBA	6	60 dBA	55	dBA
			Ldn:	75	5	16	62		350	7	754
		CI	VEL:	78	3	16	68		363	7	781

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	FH	WA-RD-77-10	8 HIGH	WAY N				:L		
Scenar Road Nan Road Segme	io: Year 2017 ne: Harley Kno nt: e/o I-215 S	With Project ox Bl. SB Fwy Ramps	5			Project N Job Nu	lame: Kn mber: 93	ox Business P 49	ark	
SITE	SPECIFIC II	NPUT DATA				NO	DISE MO	DEL INPUT	S	
Highway Data				4	Site Cor	ditions (l	Hard = 10), Soft = 15)		
Average Daily	Traffic (Adt):	23,390 vehic	cles				Au	tos: 15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Axl	es): 15		
Peak H	lour Volume:	2,339 vehicl	es		He	avy Truck	is (3+ Axl	es): 15		
Ve	hicle Speed:	45 mph			Vehicle	Mix				
Near/Far La	ne Distance:	54 feet		F	Veh	icleType	Di	av Evenina	Niaht	Daily
Site Data						AL	itos: 77	.5% 12.9%	9.69	% 91.61%
Ba	rrier Height	0.0 feet			М	edium Tru	cks: 84	.8% 4.9%	10.3%	6 1.59%
Barrier Type (0-V	/all, 1-Berm):	0.0			I	Heavy Tru	cks: 86	.5% 2.7%	10.8%	6.81%
Centerline Di	st. to Barrier:	100.0 feet			Noise Si	ource Ele	vations (in feet)		
Centerline Dist.	to Observer:	100.0 feet		F		Autos	0.00)		-
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.29	7		
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.00	4 Grade Ad	liustmer	nt: 0.0
P	ad Elevation:	0.0 feet								
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalent l	Distance	(in feet)		
	Road Grade:	0.0%				Autos:	96.41	6		
	Left View:	-90.0 degr	ees		Mediu	m Trucks:	96.32	4		
	Right View:	90.0 degr	ees		Heav	y Trucks:	96.33	3		
FHWA Noise Mod	el Calculatior	15								
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresnel	Barrier Att	en Be	erm Atten
Autos:	68.46	i 1.4	7	-4.38	В	-1.20	-4	.77 0.0	000	0.000
Medium Trucks:	79.45	-16.1	4	-4.37	7	-1.20	-4	.88 0.0	000	0.000
Heavy Trucks:	84.25	-9.8	2	-4.38	В	-1.20	-5	.16 0.0	000	0.000
Unmitigated Nois	e Levels (with	nout Topo an	d barrie	er atten	uation)					
VehicleType	Leq Peak Ho	ur Leq Da	ay .	Leg Ev	vening	Leq N	light	Ldn	(CNEL
Autos:	64	4.4	62.5		60.7		54.6	63.3	3	63.9
Medium Trucks:	57	7.7	56.2		49.9		48.3	56.	3	57.0
Heavy Trucks:	68	8.9	67.4		58.4		59.7	68.	0	68.1
Vehicle Noise:	70	0.4	68.9		62.9		61.1	69.	5	69.7
Centerline Distan	ce to Noise C	ontour (in fee	et)	70					-	
			L	70 c	3BA	65 d	ва	60 dBA	5	5 aBA
		,	Lan:	93	3	199		430		926
		(JNEL:	96	ы	201	r	447		962

	FHV	VA-RD-77-108	HIGH	IWAY N	DISE PF	REDICT	ON MO	DEL			
Scenario	o: Year 2017	With Project				Project	Name:	Knox E	Business P	ark	
Road Name	e: Harley Kno:	x Bl.				Job N	umber:	9349			
Road Segmen	t: e/o I-215 N	B Fwy Ramps									
SITE S	SPECIFIC IN	PUT DATA				N	IOISE N	IODE	L INPUT	S	
Highway Data				S	ite Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	31,237 vehicle	es					Autos:	15		
Peak Hour I	Percentage:	10%			Mee	dium Tru	ıcks (2 A	(xles)	15		
Peak He	our Volume:	3,124 vehicles	5		Hea	avy Truc	cks (3+ A	(xles)	15		
Vel	nicle Speed:	45 mph		ν	ehicle l	<i>lix</i>					
Near/Far Lar	e Distance:	54 feet			Vehi	cleType		Day	Evening	Night	Daily
Site Data						A	Autos:	77.5%	12.9%	9.6%	93.74%
Bar	rier Height:	0.0 feet			Me	edium Tr	ucks:	84.8%	4.9%	10.3%	1.119
Barrier Type (0-Wa	all, 1-Berm):	0.0			H	leavy Tr	ucks:	86.5%	2.7%	10.8%	5.15%
Centerline Dis	t. to Barrier:	100.0 feet		•	loise So	urce Fl	evation	s (in fi	pet)		
Centerline Dist. t	o Observer:	100.0 feet		-	0.00 00	Auto	s: 0(000			
Barrier Distance t	o Observer:	0.0 feet			Mediur	n Truck	s: 2.3	297			
Observer Height (/	Above Pad):	5.0 feet			Heav	v Truck	s: 8.0	004	Grade Ad	iustment	0.0
Pa	d Elevation:	0.0 feet		_							
Roa	d Elevation:	0.0 feet		L	ane Equ	livalent	Distan	ce (in	feet)		
F	Road Grade:	0.0%				Autos	s: 96.	416			
	Left View:	-90.0 degree	es		Mediur	n Trucks	s: 96.	324			
	Right View:	90.0 degree	es		Heav	y Trucks	5. 96.	333			
FHWA Noise Mode	Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresr	iel	Barrier Att	en Ber	m Atten
Autos:	68.46	2.83		-4.38		-1.20		-4.77	0.0	000	0.00
Medium Trucks:	79.45	-16.46		-4.37		-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	84.25	-9.77		-4.38		-1.20		-5.16	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barri	er atteni	uation)						
VehicleType	Leq Peak Hou	r Leq Day	r	Leq Ev	ening	Leq	Night		Ldn	C	NEL
Autos:	65	.7	63.8		62.0		56.0)	64.6	6	65.
Medium Trucks:	57	.4	55.9		49.5		48.0)	56.5	5	56.
Heavy Trucks:	68	.9	67.5		58.5		59.7	·	68.1		68.
Vehicle Noise:	70	.8	69.2		63.8		61.4	Ļ	69.9	9	70.
Centerline Distanc	e to Noise Co	ontour (in feet)								
				70 d	BA	65	dBA	6	60 dBA	55	dBA
			Ldn:	98		2	11		456	9	81
		~		4.04	2	~ ~	24		476	4	0.2.4

	FH	WA-RD-77-108	B HIGHV	NAY NO	DISE PF	REDICTIO	ON MOE	DEL			
Scenar Road Nam Road Segmei	io: Year 2017 le: Oleander A nt: e/o Drivew	With Project Av. ay 6				Project N Job Nu	Vame: K mber: 9	(nox B 349	usiness P	ark	
SITE	SPECIFIC IN	NPUT DATA				N	DISE M	ODE	L INPUT	3	
Highway Data				S	ite Con	ditions (Hard = 1	10, So	oft = 15)		
Average Daily Peak Hour Peak H Ve	Traffic (Adt): Percentage: lour Volume: hicle Speed:	2,215 vehicl 10% 222 vehicle 40 mph	es Is	V	Mei Hei ehicle I	dium Truc avy Truck Mix	A cks (2 A ks (3+ A	utos: xles): xles):	15 15 15		
Near/Far La	ne Distance:	36 feet			Vehi	cleType	Ĺ	Day	Evening	Night	Daily
Site Data Bar Barrier Type (0-W	r rier Height: 'all, 1-Berm):	0.0 feet 0.0			Me F	Au edium Tru leavy Tru	utos: 7 icks: 8 icks: 8	77.5% 34.8% 36.5%	12.9% 4.9% 2.7%	9.6% 10.3% 10.8%	63.33% 8.04% 28.63%
Centerline Dis	st. to Barrier:	100.0 feet		N	laise Sc	urco Elo	vations	(in fe	of)		
Centerline Dist. Barrier Distance Observer Height (Pa Roa	to Observer: to Observer: Above Pad): ad Elevation: ad Elevation: Road Grade: Left View: Right View:	100.0 feet 0.0 feet 5.0 feet 0.0 feet 0.0% -90.0 degre 90.0 degre	es es	L	Mediur Heav ane Equ Mediur Heav	Autos: n Trucks: y Trucks: uivalent Autos: n Trucks: y Trucks:	0.0 2.2 8.0 Distanc 98.4 98.4 98.4	00 97 04 e (in t 94 04 13	Grade Adj Teet)	ustmen	t: 0.0
EHWA Noiso Mod	ol Colculation	ic.									
VehicleType	REMEI	Traffic Flow	Dist	ance	Finite	Road	Fresne	-/	Rarrier Att	n Be	rm Atten
Autos:	66.51	-9.86		-4.52		-1.20	-	4.77	0.0	00	0.000
Medium Trucks: Heavy Trucks:	77.72 82.99	-18.82 -13.30		-4.51 -4.51		-1.20 -1.20	-	4.88 5.16	0.0 0.0	00 00	0.000 0.000
Unmitigated Noise	e Levels (with	out Topo and	barrier	r attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	V .	Leq Eve	ening	Leq N	light		Ldn	0	NEL
Autos:	50).9	49.0		47.3		41.2		49.8		50.4
Medium Trucks:	53	3.2	51.7		45.3		43.8		52.2		52.5
Heavy Trucks:	64	1.0	62.6		53.5		54.8		63.1		63.2
Vehicle Noise:	64	1.5	63.1		54.9		55.3		63.6		63.8
Centerline Distant	ce to Noise C	ontour (in fee	t)								
				70 dl	BA	65 d	BA	6	0 dBA	5	5 dBA
			Ldn:	38		81			175		377
		С	NEL:	39		83	3		179		386

	FH	WA-RD-77-10	B HIGH	I YAWH	NOISE P	REDICTIC	ON MOD	DEL			
Scenar Road Nam Road Segme	io: Year 2017 ie: Oleander / nt: w/o Harvill	With Project Av. Av.				Project N Job Nu	lame: K mber: 9	(nox B 1349	usiness Pa	ark	
SITE	SPECIFIC II	NPUT DATA				N	DISE M	ODE		6	
Highway Data					Site Cor	nditions (l	Hard = 1	10, So	ft = 15)		
Average Daily	Traffic (Adt):	2,615 vehic	les				A	utos:	15		
Peak Hour	Percentage:	10%			Me	edium Truc	cks (2 A.	xles):	15		
Peak H	lour Volume:	262 vehicle	es		He	avy Truck	(3+ A	xles):	15		
Ve	hicle Speed:	40 mph		-	Vahiala	Mix					
Near/Far La	ne Distance:	36 feet		-	Venicle			Dav	Evoning	Night	Daily
Site Data					VEI	Ai	itos: 7	77.5%	12.9%	9.6%	68.00%
Ba	wier Height	0.0 (act			М	edium Tru	icks: 8	34.8%	4.9%	10.3%	6.98%
Barrier Type (0-M	(all 1-Rorm)	0.0 1001				Heavy Tru	icks: 8	36.5%	2.7%	10.8%	25.03%
Centerline Di	st. to Barrier:	100.0 feet		-							
Centerline Dist.	to Observer:	100.0 feet		-	Noise S	ource Ele	vations	(in fe	et)		
Barrier Distance	to Observer:	0.0 feet				Autos:	0.0	00			
Observer Height (Above Pad):	5.0 feet			Mediu	m Trucks:	2.2	97	Our de Ad		
Pa	ad Elevation:	0.0 feet			Hea	vy Trucks:	8.0	04	Grade Adj	ustment	: 0.0
Roa	ad Elevation:	0.0 feet		Ī	Lane Eq	uivalent	Distanc	e (in f	eet)		
	Road Grade:	0.0%				Autos:	98.4	94			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	98.4	04			
	Right View:	90.0 degre	es		Hea	vy Trucks:	98.4	13			
FHWA Noise Mod	el Calculation	าร									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresne	el i	Barrier Atte	en Ber	m Atten
Autos:	66.51	-8.83	3	-4.5	52	-1.20	-	4.77	0.0	00	0.000
Medium Trucks:	77.72	-18.72	2	-4.5	51	-1.20	-	4.88	0.0	00	0.000
Heavy Trucks:	82.99	-13.17	,	-4.5	51	-1.20	-	5.16	0.0	00	0.000
Unmitigated Noise	e Levels (with	hout Topo and	l barri	er atter	nuation)						
VehicleType	Leq Peak Ho	ur Leq Da	y	Leq E	vening	Leq N	light		Ldn	C	NEL
Autos:	52	2.0	50.1		48.3		42.2		50.9		51.5
Medium Trucks:	53	3.3	51.8		45.4		43.9		52.3		52.6
Heavy Trucks:	64	4.1	62.7		53.7		54.9		63.3		63.4
Vehicle Noise:	64	4.7	63.2		55.2		55.4		63.8		64.0
Centerline Distant	ce to Noise C	ontour (in fee	t)								
				70	dBA	65 d	BA	6	0 dBA	55	dBA
			Ldn:	3	39	83			180	3	87
	CNE			4	40	86	86 184			3	97

Monday, June 08, 2015

Monday, June 08, 2015

	FH	WA-RD-77-108	B HIGH	NAY N	OISE PI	REDICTIO	N MODE	iL.			
Scenai Road Nan Road Segme	rio: Year 2035 ne: Harvill Av. nt: s/o Harley	Without Projec Knox Bl.	t			Project N Job Nur	lame: Kn nber: 93	ox Business 49	Park		
SITE	SPECIFIC IN	NPUT DATA				NC	ISE MO	DEL INPU	TS		
Highway Data				5	Site Cor	ditions (H	lard = 10), Soft = 15)			
Average Daily	Traffic (Adt):	23,600 vehic	es				Au	tos: 15			
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Axl	es): 15			
Peak H	lour Volume:	2,360 vehicle	s		He	avy Truck	s (3+ Axl	es): 15			
Ve	hicle Speed:	50 mph		1	/ohiclo	Mix					
Near/Far La	ne Distance:	48 feet		E F	Veh	icleType	Di	av Evening	y Ni	aht	Daily
Site Data						Au	tos: 77	.5% 12.9%	6 9	9.6%	93.82%
Ba	rrier Height:	0.0 feet			М	edium Tru	cks: 84	.8% 4.9%	6 10	0.3%	1.09%
Barrier Type (0-V	Vall, 1-Berm):	0.0			I	Heavy Tru	cks: 86	.5% 2.7%	6 10	0.8%	5.09%
Centerline Di	ist. to Barrier:	100.0 feet			Voise Su	ource Elev	vations (in feet)			
Centerline Dist.	to Observer:	100.0 feet		Ē		Autos:	0.00	າ າ			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.29	7			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.00	4 Grade A	diusti	ment:	0.0
P	ad Elevation:	0.0 feet				,					
Ro	ad Elevation:	0.0 feet		L	.ane Eq	uivalent L	Distance	(in feet)			
	Road Grade:	0.0%				Autos:	97.20	6			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	97.11	5			
	Right View:	90.0 degre	es		Heav	y Trucks:	97.12	4			
FHWA Noise Mod	lel Calculation	IS									
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresnel	Barrier A	Atten	Berr	n Atten
Autos:	70.20	1.16		-4.43	3	-1.20	-4	.77 (0.000		0.000
Medium Trucks:	81.00	-18.21		-4.43	3	-1.20	-4	.88 (0.000		0.000
Heavy Trucks:	85.38	-11.50		-4.43	3	-1.20	-5	.16 (0.000		0.000
Unmitigated Nois	e Levels (with	out Topo and	barrie	r atten	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	/	Leq Ev	rening	Leq N	ight	Ldn		C٨	IEL
Autos:	65	5.7	63.8		62.1		56.0	64	1.6		65.2
Medium Trucks:	57	7.2	55.7		49.3		47.7	56	6.2		56.4
Heavy Trucks:	68	3.3	66.8		57.8		59.0	67	7.4		67.5
Vehicle Noise:	70).4	68.8		63.6		61.0	69	9.5		69.7
Centerline Distan	ce to Noise C	ontour (in fee	t)								
				70 a	IBA	65 dE	BA	60 dBA		55 (:IBA
			Ldn:	92	2	198		427		91	9
		С	NEL:	96	6	207	,	447		96	52

Scenario	: Year 2035 W	/ithout Project			Project Na	me: Kno	ox Business F	Park	
Road Name	: Harvill Av.				Job Num	ber: 934	9		
Road Segmen	f: n/o Oleande	r Av.							
SITE S	PECIFIC IN	PUT DATA			NOI	SE MO	DEL INPUT	S	
Highway Data				Site Con	ditions (Ha	ard = 10,	Soft = 15)		
Average Daily T	raffic (Adt): 2	23,600 vehicles				Aut	os: 15		
Peak Hour F	Percentage:	10%		Mee	dium Truck	s (2 Axle	es): 15		
Peak Ho	ur Volume:	2,360 vehicles		Hea	avy Trucks	(3+ Axle	s): 15		
Veh	icle Speed:	50 mph		Vehicle I	Nix				-
Near/Far Lan	e Distance:	48 feet	-	Vehi	cleTvpe	Da	v Evenina	Niaht	Dailv
Site Data					Auto	os: 77.	5% 12.9%	9.6%	93.82
Barr	ior Hoiaht	0.0 feet		Me	dium Truc	ks: 84.	8% 4.9%	10.3%	1.099
Barrier Type (0-Wa	II. 1-Berm) [.]	0.0		H	leavy Truc	ks: 86.	5% 2.7%	10.8%	5.09
Centerline Dist	to Barrier:	100.0 feet	-	N-/ 0-		- 41 <i>(</i> 1	- 6 41		
Centerline Dist. to	o Observer:	100.0 feet		NOISE SO	urce Eleva	ations (I	n reet)		
Barrier Distance to	o Observer:	0.0 feet		1.4 × 16 × 10	Autos:	0.000			
Observer Height (A	bove Pad):	5.0 feet		Meaiur	n Trucks:	2.297	Crada As	livetnent	
Pad	d Elevation:	0.0 feet		neav	y mucks.	0.004	Grade Ad	jusuneni	0.0
Road	d Elevation:	0.0 feet		Lane Equ	uivalent Di	stance ('in feet)		
R	oad Grade:	0.0%			Autos:	97.206			
	Left View:	-90.0 degrees		Mediur	n Trucks:	97.115			
	Right View:	90.0 degrees		Heav	y Trucks:	97.124			
FHWA Noise Mode	Calculations								
VehicleType	REMEL	Traffic Flow D	istance	Finite	Road	Fresnel	Barrier At	ten Ber	m Atter
Autos:	70.20	1.16	-4.4	3	-1.20	-4.	77 0.	000	0.00
Medium Trucks:	81.00	-18.21	-4.4	3	-1.20	-4.6	88 0.	000	0.00
Heavy Trucks:	85.38	-11.50	-4.4	3	-1.20	-5.	16 0.	000	0.00
Unmitigated Noise	Levels (witho	ut Topo and barı	rier atter	nuation)					
VehicleType I	eq Peak Hour	Leq Day	Leq E	vening	Leq Nig	ht	Ldn	Ci	VEL
Autos:	65.7	7 63.8		62.1		56.0	64.	6	65
Medium Trucks:	57.2	2 55.7		49.3		47.7	56.	2	56
Heavy Trucks:	68.3	3 66.8		57.8		59.0	67.	4	67.
Vehicle Noise:	70.4	4 68.8		63.6		61.0	69.	5	69.
Centerline Distance	e to Noise Col	ntour (in feet)	70	dBA	65 dB	4	60 dBA	55	dBA
		L day		2	109	· .	427		19
			_		1 -1/ 1				
		CNEL:	g	16	207		447	g	62

	FH	WA-RD-77-108	HIGHW	AY NOISE	PREDICT	ION MOI	DEL			
Scenar Road Nar Road Segme	io: Year 2035 ie: Harvill Av. nt: s/o Oleand	Without Projec	t		Project Job N	t Name: I lumber: S	Knox B 9349	usiness P	ark	
SITE	SPECIFIC IN	NPUT DATA			1	NOISE N	IODE		s	
Highway Data				Site C	onditions	(Hard =	10, So	oft = 15)		
Average Daily Peak Hour Peak H	Traffic (Adt): Percentage: lour Volume:	28,600 vehicle 10% 2,860 vehicle	es s		Medium Tr Heavy Tru) rucks (2 A cks (3+ A	Autos: Ixles): Ixles):	15 15 15		
Ve	hicle Speed:	50 mph		Vehic	le Mix					
Near/Far La	ne Distance:	48 feet		V	ehicleType	e	Day	Evening	Night	Daily
Site Data Ba	rrier Height:	0.0 feet		-	Medium T	Autos: rucks:	77.5% 84.8%	12.9% 4.9%	9.6% 10.3%	93.82%
Barrier Type (0-W	/all, 1-Berm):	0.0			Heavy I	rucks:	86.5%	2.1%	10.8%	5.09%
Centerline Di	st. to Barrier:	100.0 feet		Noise	Source E	levation	s (in fe	et)		
Observer Height (to Observer: to Observer: (Above Pad):	0.0 feet 5.0 feet		Med He	Auto dium Truck eavy Truck	vs: 0.0 vs: 2.2 vs: 8.0	000 297 004	Grade Adj	iustment	: 0.0
Ro	ad Elevation:	0.0 feet		Lane	Equivalen	t Distand	e (in f	eet)		
710	Road Grade:	0.0%			Auto	s: 97.2	206			
	Left View:	-90.0 degre	es	Med	dium Truck	s: 97.	115			
	Right View:	90.0 degre	es	He	eavy Truck	s: 97.1	124			
FHWA Noise Mod	el Calculation	IS		-						
VehicleType	REMEL	Traffic Flow	Distan	ce Fin	ite Road	Fresn	el	Barrier Att	en Ber	m Atten
Autos:	70.20	1.99		-4.43	-1.20		-4.77	0.0	000	0.00
Medium Trucks:	81.00	-17.38		-4.43	-1.20		-4.88	0.0	000	0.00
Heavy Trucks:	85.38	-10.66		-4.43	-1.20		-5.10	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrier a	ttenuatio	n)		1		-	
Vehicle I ype	Leq Peak Ho	ur Leq Day	Le	eq Evening	1 Leq	Night		Ldn	C	NEL
Autos:	66	0.0	04.7 FC F	62	2.9	56.8		65.5	>	66.
Heavy Trucks:	30).U) 1	67 7	50	 	46.0 50.0		57.0	, >	57. 68.
Vehicle Noise:	71	1.2	69.6	64	1.4	61.8		70.3	3	70.
Centerline Distan	ce to Noise C	ontour (in feet)							
				70 dBA	65	dBA	6	0 dBA	55	dBA
			Ldn:	105	2	25		485	1,	045

Scenario: Year 2035 Without Project Road Name: I-215 SB Fwy Road Segment: n/o Hattey Knox BI. Project Name: Knox Business Park Job Number: 9349 Sitte Specific INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 68,600 vehicles Peak Hour Volume: 6,860 vehicles Vehicle Speed: 65 mph Autos: 15 Barrier Height: 0.0 feet Barrier Height: 0.0 feet Barrier Type (O-Wall, 1-Berrier: 100.0 feet Autos: 77.5% 12.9% 9.6% 93 Barrier Dist. to Daserver: 0.0 feet Barrier Dist. to Observer: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Laft View: 90.0 degrees Redium Trucks: 8.4.30 Laft View: 90.0 degrees Heavy Trucks: 95.525 Medium Trucks: 95.525 Heavy Trucks: 95.525 Medium Trucks: 95.525 Heavy Trucks: 95.441 FHWA Noise Model Calculations Vehicle Type Lane Equivaliant Laft Vehicle Type Read Grade: 0.0% 4.31 -1.20 Medium Trucks: 84.86 -4.32		FH\	WA-RD-77-108	HIGHWA	Y NOI	SE PREDICTIO	ON MODEL		
Road Name: 1-215 SB Fwy Road Segment: Job Number: 9349 Road Segment: No Iste MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 68,600 vehicles Autos: Peak Hour Volume: 6,860 vehicles Autos: Vehicle Speed: 65 mph Medium Trucks: (3+ Axles): 15 Site Data Autos: 15 Heavy Trucks: (3+ Axles): 15 Barrier Height: 0.0 feet Vehicle Mix Vehicle Mix 12.9% 9.6% 93 Barrier Type (0-Wall, 1-Berm): 0.0 feet Mudos: 77.5% 12.9% 9.6% 93 Centerline Dist. to Observer: 100.0 feet Autos:: 0.000 Medium Trucks: 2.297 10.8% 5 Observer Height: 0.0 feet Autos:: 0.000 Medium Trucks: 9.5.52 Left View: 90.0 degrees Heavy Trucks: 9.5.432 Heavy Trucks: 9.5.432 FHWA Noise Model Calculations Vehicle Type ReBERL Traffic Flow <td< th=""><th>Scenari</th><th>o: Year 2035</th><th>Without Project</th><th>t</th><th></th><th>Project I</th><th>Vame: Knox</th><th>Business Pa</th><th>rk</th></td<>	Scenari	o: Year 2035	Without Project	t		Project I	Vame: Knox	Business Pa	rk
Road Segment: n/o Harley Knox BI. SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 68,600 vehicles Autos: 15 Peak Hour Volume: 6,860 vehicles Medium Trucks (2 Axles): 15 Vehicle Speed: 65 mph Medium Trucks (2 Axles): 15 Vehicle Max Vehicle Max Vehicle Max Near/Far Lane Distance: 60 feet Vehicle Max Nage Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 0.3% 1 Barrier Joist. to Barrier: 100.0 feet Molise Source Elevations (in feet) Nolse Nolse Nolse Nolse Observer Height (Above Pad): 5.0 feet Molegrees Right View: 90.0 degrees Medium Trucks: 8.004 Grade Elevation: 0.0 feet Road Elevation: 0.0 feet Autos: 95.525 Medium Trucks: 95.432 Heavy Trucks: 95.448 -4.147 -4.31 -1.20 -4.77	Road Nam	e: I-215 SB F	wy			Job Nu	mber: 9349		
SITE SPECIFIC INPUT DATA NOISE MODEL INPUTS Highway Data Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 68,600 vehicles Peak Hour Percentage: 10% Vehicel Speech: 68,600 vehicles Vehicel Speech: 68,600 vehicles Vehicel Speech: 68,600 vehicles Barrier Height: 0.0 feet Barrier Height: 0.0 feet Barrier Height: 0.0 feet Centerline Dist. to Daserver: 100.0 feet Barrier Jype (O-Wail, 1-Berrin): 0.0 feet Barrier Height: 0.0 feet Observer Height (Above Pad): 5.0 feet Road Grade: 0.0% Left View: 90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Heavy Trucks: 8.542 Heavy Trucks: 95.432 Heavy Trucks: 95.432 Heavy Trucks: 95.432 Heavy Trucks: 95.432 Heavy Trucks: 8.818 -4.02 -4.77	Road Segmer	nt: n/o Harley	Knox Bl.						
Site Conditions (Hard = 10, Soft = 15) Average Daily Traffic (Adt): 68,600 vehicles Autos: 15 Peak Hour Percentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Volume: 6,860 vehicles Medium Trucks (3+ Axles): 15 Vehicle Speed: 65 mph Vehicle Type Day Evening Night D Site Data Autos: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Autos: 77.5% 12.9% 9.6% 93 Barrier Type (0-Wall, 1-Berm): 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1 Barrier Dist. to Daserver: 100.0 feet Autos: 0.000 Medium Trucks: 2.297 10.8% 5 Observer Height: 0.0 feet Autos: 9.525 Lane Equivalent Distance (in feet) 0.000 Road Elevation: 0.0 feet Autos: 95.525 Lane Equivalent Distance (in feet) 0.000 0 Road Elevation: 0.06 degrees Medium Trucks:	SITE	SPECIFIC IN	NPUT DATA			N	DISE MOD	EL INPUTS	
Average Daily Traffic (Adt): 68,600 vehicles Autos: 15 Peak Hour Opercentage: 10% Medium Trucks (2 Axles): 15 Peak Hour Opercentage: 10% Heavy Trucks (2 Axles): 15 Vehicle Speed: 65 mph Vehicle Mix Vehicle Mix Vehicle Mix Near/Far Lane Distance: 60 feet Vehicle Mix Vehicle Mix Vehicle Mix Site Data Autos: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Autos: 77.5% 10.8% 5 Centerline Dist. to Diserver: 100.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1 Barrier Height (Above Pad): 5.0 feet Motis 0.000 Medium Trucks: 80.04 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 95.525 Medium Trucks: 95.432 Road Elevation: 0.0 feet Left View: 90.0 degrees Medium Trucks: 95.432 Vehicle Type REMEL Traffic Flow Distance	Highway Data				Site	e Conditions (Hard = 10, S	Soft = 15)	
Peak Hour Volume: 6,860 vehicles Medium Trucks (2 Axles): 15 Peak Hour Volume: 6,860 vehicles Heavy Trucks (2 Axles): 15 Vehicle Speed: 65 mph Heavy Trucks (2 Axles): 15 Site Data Vehicle Type Day Evening Night D Site Data Autos: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Autos: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Autos: 77.5% 12.9% 9.6% 93 Barrier Joet Observer: 100.0 feet Autos: 86.5% 2.7% 10.8% 5 Centerline Dist. to Daserver: 100.0 feet Autos: 8.00 Medium Trucks: 2.97 Heavy Trucks: 8.00 6.000 Medium Trucks: 2.97 10.8% 5 Observer Height (Above Pad): 5.0 feet Autos: 95.525 Medium Trucks: 95.423 Heavy Trucks: 95.423 Heavy Trucks: 95.423 Heavy Trucks:	Average Daily	Traffic (Adt):	68,600 vehicle	es			Autos	: 15	
Peak Hour Volume: 6,860 vehicles Vehicle Speed: Heavy Trucks (3+ Axles): 15 Near/Far Lane Distance: 60 feet Vehicle Mix Vehicle Type Day Evening Night D Site Data Autos: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Autos: 77.5% 12.9% 9.6% 93 Barrier Type (0-Wail, 1-Berm): 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1 Barrier Dist. to Dbserver: 100.0 feet Mole Source Ievations: (in feet) Noise Source Ievations: 0.000 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.297 10.8% 5 Cost of Grade: 0.0% Autos: 95.525 Medium Trucks: 5.432 FHWA Noise Model Calculations Vehicle Type ReMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern A Autos: 74.55 4.65 -4.31 -1.20 -5.16 0.000 0	Peak Hour	Percentage:	10%			Medium True	cks (2 Axles)): 15	
Vehicle Speed: 65 mph Near/Far Lane Distance: 60 feet Vehicle Mix Site Data Vehicle Type Day Evening Night D Site Data Autos: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1 Barrier Type (0-Wail, 1-Berm): 0.0 feet Moise Source Elevations (in feet) 0.84.8% 4.9% 10.3% 1 Centerline Dist. to Barrier: 100.0 feet Moise Source Elevations (in feet) Moise Source Elevations (in feet) Observer Height (Above Pad): 5.0 feet Autos: 9.5.25 Medium Trucks: 8.0.04 Grade Adjustment: 0.0 Road Grade: 0.0% Autos: 95.432 Heavy Trucks: 95.432 PHWA Noise Model Calculations Distance Finite Road Fresnel Barrier Atten Berr A Autos: 73.7 71.8 70.0 64.0 72.6 Medium Trucks: 84.86 -14.72 -4.31	Peak H	our Volume:	6,860 vehicle	s		Heavy Truck	ks (3+ Axles,): 15	
Near/Far Lane Distance: 60 feet Vehicle Type Day Evening Night D. Site Data Autos: 77.5% 12.9% 9.6% 9.3% Barrier Yie (O'Wall, 1-Berm): 0.0 60 66 65.5% 2.7% 10.8% 9.8% 9.9% 9.8% 9.9% 9.8% 9.9% 9.8% 9.8% 9.9% 9.8%	Vei	hicle Speed:	65 mph		Va	hicle Mix			
Site Data Auto:: 77.5% 12.9% 9.6% 93 Barrier Height: 0.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1 Barrier Type (0-Wail, 1-Berri): 0.0 Centerline Dist. to Darrier: 100.0 feet Medium Trucks: 84.8% 4.9% 10.3% 1 Barrier Dist. to Darrier: 100.0 feet Noise Source Elevations (in feet) Noise Source Elevations (in feet) Noise Source Elevations (in feet) Noise Source Interview: 0.000 Observer Height (Above Pad): 5.0 feet Autos: 0.000 Medium Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 9.525 Medium Trucks: 95.525 Lane Equivalent Distance (in feet) Autos: 95.525 Medium Trucks: 95.441 FHWA Noise Model Calculations Vehicle Type ReMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern A Medium Trucks: 88.18 -4.31 -1.20 -4.77 0.000 (interview)	Near/Far Lai	ne Distance:	60 feet		101	VehicleTvpe	Dav	Evenina	Night Daily
Barrier Height: 0.0 feet Barrier Type (0-Wall, 1-Berm): 0.0 Centerline Dist. to Barrier: 100.0 feet Barrier Dist. to Barrier: 100.0 feet Barrier Dist. to Diserver: 100.0 feet Barrier Distance to Observer: 100.0 feet Doserver Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: 90.0 degrees PHWA Noise Model Calculations Distance VehicleType REMEL Traffic Flow VehicleType REMEL Traffic Flow Medium Trucks: 84.86 -14.72 Autos: 74.55 4.65 Heavy Trucks: 88.18 -8.00 Medium Trucks: 84.86 -14.72 Heavy Trucks: 84.86 -14.72 Heavy Trucks: 84.86 -0.000 Heavy Trucks: 84.86 -0.000 Heavy Trucks: 84.86 -14.72 Heavy Trucks: 86.	Site Data					A	utos: 77.5	% 12.9%	9.6% 93.82%
Barrier Type (0-Wall, 1-Berri): 0.0 Heavy Trucks: 86.5% 2.7% 10.8% 5 Centerline Dist. to Dareier: 100.0 feet Noise Source Elevations (in feet) Noise Source Elevation (in feet) Noise Sou	Bar	rier Height	0.0 feet			Medium Tru	icks: 84.8	% 4.9%	10.3% 1.09%
Centerline Dist. to Barrier: 100.0 feet Centerline Dist. to Observer: 100.0 feet Barrier Distance to Observer: 100.0 feet Doserver Height (Above Pad): 5.0 feet Pad Elevation: 0.0 feet Road Elevation: 0.0 feet Road Elevation: 0.0 feet Road Grade: 0.0% Left View: 90.0 degrees Right View: 90.0 degrees Right View: 90.0 degrees Heavy Trucks: 85.425 Medium Trucks: 95.441 FHWA Noise Model Calculations Vehicle Type Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Medium Trucks: 84.86 -14.72 4.88 -14.72 -4.31 -1.20 Medium Trucks: 84.86 -14.72 -4.31 Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night C/n	Barrier Type (0-W	all, 1-Berm):	0.0			Heavy Tru	icks: 86.59	% 2.7%	10.8% 5.09%
Centerline Dist. to Observer: 100.0 feet Indice Gound Stance Barrier Distance to Observer: 0.0 feet Autos: 0.000 Observer Height (Above Pad): 5.0 feet Medium Trucks: 2.297 Observer Height (Above Pad): 5.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 Road Elevation: 0.0 feet Autos: 95.525 Medium Trucks: 95.525 Left View: -90.0 degrees Medium Trucks: 95.541 FHWA Noise Model Calculations VehicleType Read Model Calculations VehicleType Read Aistance Finite Road Fresnel Barrier Atten Bern A Mutos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 (0 Medium Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 (0 Umintigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 56.8 55	Centerline Dis	st. to Barrier:	100.0 feet		No	ise Source Ele	wations (in	foot)	
Barrier Distance to Observer: 0.0 feet Image: Construct Science Omediate Observer Height (Above Pad): 5.0 feet Mediation Trucks: 2.297 Pad Elevation: 0.0 feet Mediation Trucks: 2.297 Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Constructs: Road Grade: 0.0% Autos: 95.525 Left View: 90.0 degrees Mediation Trucks: 95.432 Heavy Trucks: 95.441 Barrier Atten Berrier Atten VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berrier Atten Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.77 0.000 0 Medium Trucks: 84.86 -14.72 -4.31 -1.20 -5.16 0.000 0 Ummitgated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leg Peak Hour Leg Day Leg Evening Leg Night Ldn CNEL Medium Trucks: 64.6 63.1 56.8	Centerline Dist.	to Observer:	100.0 feet		110	Autoo	0.000		
Observer Height (Above Pad): 5.0 feet Interview Pade Elevation: 0.0 feet Pad Elevation: 0.0 feet Heavy Trucks: 8.004 Grade Adjustment: 0.0 feet Road Elevation: 0.0 feet Lare Equivalent Distance (in feet) Lare Equivalent Distance (in feet) Road Elevation: 0.0 feet Autos: 95.525 Right View: 90.0 degrees Meeing Trucks: 95.432 Heavy Trucks: 95.432 Heavy Trucks: 95.431 FHWA Noise Model Calculations Distance Finite Road Fresnel Barrier Atten Bern A Medium Trucks: 74.55 4.65 -4.32 -1.20 -4.77 0.000 (0) Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 (0) Umitigated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 Meedium Trucks: 64.6 63.1 </th <th>Barrier Distance</th> <th>to Observer:</th> <th>0.0 feet</th> <th></th> <th></th> <th>Autos.</th> <th>. 0.000</th> <th></th> <th></th>	Barrier Distance	to Observer:	0.0 feet			Autos.	. 0.000		
Pad Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade: 0.0% Autos: 95.525 Left View: -90.0 degrees Medium Trucks: 95.525 Right View: 90.0 degrees Medium Trucks: 95.525 FHWA Noise Model Calculations Medium Trucks: 95.525 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern A Autos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 0 Medium Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unmitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.02 65.2 63.7 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Eenterline Distance to Noise Contour (in feet)	Observer Height (Above Pad):	5.0 feet			Hoowy Trucks	. 2.251	Grade Adii	istment: 0.0
Road Elevation: 0.0 feet Lane Equivalent Distance (in feet) Road Grade 0.0% Autos: 95.525 Left View: -90.0 degrees Medium Trucks: 95.432 FHWA Noise Model Calculations Heavy Trucks: 95.432 VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berra Atten Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.77 0.000 0 Medium Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unnitigated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.8 71.2 68.0 76.5 Center/line Distance to Noise Contour (in feet) 70 dBA 65 dBA	Pa	ad Elevation:	0.0 feet			meavy mucks.	0.004	endde maje	0.0
Road Grade: 0.0% Autos: 95.525 Left View: 90.0 degrees Medium Trucks: 95.432 FHWA Noise Model Calculations Heavy Trucks: 95.431 Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern A Autos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 00 Medium Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 00 Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 00 Umitigated Noise Levels (without Topo and barrier attenuation) Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 65.7 73.8 Vehicle Noise: 74.7 73.2 64.2 65.5 73.8 74.7 73.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA	Roa	ad Elevation:	0.0 feet		Lai	ne Equivalent	Distance (in	i feet)	
Left View: 90.0 degrees Medium Trucks: 95.432 FHWA Noise Model Calculations Heavy Trucks: 95.441 FHWA Noise Model Calculations Enrite Road Fresnel Barrier Atten Bern A Autos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 0 Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.87 0.000 0 Medium Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Uminitigated Noise Levels (without Topo and barrier attenuation) VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.00 0 0 0 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 65.42 65.5 73.8 Vehicle Noise: 71.7 73.2 64.2 65.5 73.8 Vehicle Noise: 74.7 73.2 64.2 65.5 55.42	F	Road Grade:	0.0%			Autos	95.525		
Right View: 90.0 degrees Heavy Trucks: 95.441 FHWA Noise Model Calculations Environment of the second seco		Left View:	-90.0 degre	es	/	Aedium Trucks:	95.432		
FHWA Noise Model Calculations VehicleType REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Bern A Autos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 0 Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.88 0.000 0 Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unmitgated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Peak Hour Leq Day Leq Vening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.8 71.2 68.0 76.5 Center/line Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA		Right View:	90.0 degre	es		Heavy Trucks	95.441		
Vehicle Type REMEL Traffic Flow Distance Finite Road Fresnel Barrier Atten Berm A Autos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 0 Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.88 0.000 0 Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unmitgated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.00 64.0 72.6 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	FHWA Noise Mode	el Calculation	IS						
Autos: 74.55 4.65 -4.32 -1.20 -4.77 0.000 0 Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.88 0.000 0 Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unnitigated Noise Levels (without Topo and barrier attenuation) Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 63.7 Heavy Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 5 55.4	VehicleType	REMEL	Traffic Flow	Distan	ce	Finite Road	Fresnel	Barrier Atte	n Berm Atten
Medium Trucks: 84.86 -14.72 -4.31 -1.20 -4.88 0.000 0 Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unmitigated Noise Levels (without Topo and barrier attenuation) Ueq Real Hour Leq Day Leq Revening Leq Night Ldn CNEL Vehicle Type Leq Peak Hour Leq Day Leq Revening Leq Night Ldn CNEL Medium Trucks: 73.7 71.8 70.0 64.0 72.6 Medium Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Autos:	74.55	4.65	-	4.32	-1.20	-4.77	0.00	0.000
Heavy Trucks: 88.18 -8.00 -4.31 -1.20 -5.16 0.000 0 Unmitigated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 64.0 72.6 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 63.7 Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 65.5 65.5 75.8 64.2 65.5 75.8 64.2 65.5 75.8 64.2 65.5 75.5 65.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 75.5 65.5 65.5 65.5 65.5 65.5 65.5 <td>Medium Trucks:</td> <td>84.86</td> <td>-14.72</td> <td>-</td> <td>4.31</td> <td>-1.20</td> <td>-4.88</td> <td>0.00</td> <td>0.000</td>	Medium Trucks:	84.86	-14.72	-	4.31	-1.20	-4.88	0.00	0.000
Unmitigated Noise Levels (without Topo and barrier attenuation) Vehicle Type Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 64.6 63.1 56.8 55.2 63.7 14.9 14.7 73.2 64.2 65.5 73.8 14.6 16.5 1	Heavy Trucks:	88.18	-8.00	-	4.31	-1.20	-5.16	0.00	0.000
VehicleType Leq Peak Hour Leq Day Leq Evening Leq Night Ldn CNEL Autos: 73.7 71.8 70.0 64.0 72.6 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Unmitigated Noise	e Levels (with	out Topo and	barrier a	ttenua	tion)			
Autos: 73.7 71.8 70.0 64.0 72.6 Medium Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	VehicleType	Leq Peak Hou	ur Leq Day	′ Le	q Ever	ning Leq N	light	Ldn	CNEL
Medium Trucks: 64.6 63.1 56.8 55.2 63.7 Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Autos:	73	3.7	71.8		70.0	64.0	72.6	73.2
Heavy Trucks: 74.7 73.2 64.2 65.5 73.8 Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA 024 024 024 040 05 dBA 05 dBA 05 dBA 05 dBA	Medium Trucks:	64	1.6	63.1		56.8	55.2	63.7	63.9
Vehicle Noise: 77.4 75.8 71.2 68.0 76.5 Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Heavy Trucks:	74	1.7	73.2		64.2	65.5	73.8	73.9
Centerline Distance to Noise Contour (in feet) 70 dBA 65 dBA 60 dBA 55 dBA	Vehicle Noise:	77	7.4	75.8		71.2	68.0	76.5	76.8
70 dBA 65 dBA 60 dBA 55 dBA	Centerline Distance	e to Noise Co	ontour (in feet)					
L day 074 500 4.050 0.705					70 dB/	A 65 d	BA	60 dBA	55 dBA
Lan: 2/1 583 1,256 2,705				Ldn:	271	58	3	1,256	2,705
CNEL: 285 613 1,321 2,847			Ci	VEL:	285	61	3	1,321	2,847

Monday, June 08, 2015

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	FH	WA-RD-77-108		NAY N	OISE P	REDICTIO		<u> </u>	_	
Scenar Road Nan Road Segme	io: Year 2035 ne: I-215 SB F nt: s/o Harley	Without Project wy Knox Bl.	zt			Project N Job Nur	lame: Kno nber: 934	x Business P 9	ark	
SITE	SPECIFIC I	NPUT DATA				NC	ISE MO	DEL INPUT	S	
Highway Data				S	lite Cor	nditions (H	lard = 10,	Soft = 15)		
Average Daily	Traffic (Adt):	62,400 vehic	les				Auto	os: 15		
Peak Hour	Percentage:	10%			Me	edium Truc	ks (2 Axle	s): 15		
Peak H	lour Volume:	6,240 vehicle	s		He	eavy Truck	s (3+ Axle	s): 15		
Ve	hicle Speed:	65 mph		v	ehicle	Mix				-
Near/Far La	ne Distance:	60 feet		-	Veh	icleType	Daj	/ Evening	Night	Daily
Site Data						Au	tos: 77.	5% 12.9%	9.6	% 93.82%
Ba	rrier Heiaht:	0.0 feet			М	edium Tru	cks: 84.	8% 4.9%	10.3	% 1.09%
Barrier Type (0-W	/all, 1-Berm):	0.0				Heavy Tru	cks: 86.	5% 2.7%	10.8	% 5.09%
Centerline Di	st. to Barrier:	100.0 feet		٨	loise S	ource Ele	vations (ii	n feet)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.000	,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.297			
Observer Height	(Above Pad):	5.0 feet			Hear	v Trucks:	8.004	Grade Ad	justme	nt: 0.0
P	ad Elevation:	0.0 feet							·	
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent L	Distance (in feet)		
	Road Grade:	0.0%				Autos:	95.525			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.432			
	Right View:	90.0 degre	es		Hear	vy Trucks:	95.441			
FHWA Noise Mod	el Calculation	IS								
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresnel	Barrier Att	ten B	erm Atten
Autos:	74.55	4.24		-4.32		-1.20	-4.7	77 0.0	000	0.000
Medium Trucks:	84.86	-15.13		-4.31		-1.20	-4.8	38 0.0	000	0.000
Heavy Trucks:	88.18	-8.41		-4.31		-1.20	-5.1	16 0.0	000	0.000
Unmitigated Nois	e Levels (with	out Topo and	l barrie	r attenı	uation)					
VehicleType	Leq Peak Ho	ur Leq Da	y	Leq Ev	ening	Leq N	ight	Ldn		CNEL
Autos:	73	3.3	71.4		69.6		63.5	72.3	2	72.8
Medium Trucks:	64	1.2	62.7		56.4		54.8	63.3	3	63.5
Heavy Trucks:	74	1.3	72.8		63.8		65.0	73.4	4	73.5
Vehicle Noise:	77	7.0	75.4		70.8		67.6	76.	1	76.4
Centerline Distan	ce to Noise C	ontour (in fee	t)							
			L	70 d	BA	65 dE	BA	60 dBA	5	i5 dBA
			Ldn:	254	4	547		1,179		2,539
	CNEL:			26	(576	i i	1,241		2,673

	FHV	VA-RD-77-108	HIGH	IWAY NO	DISE PE	REDICTI	ON MOE	EL			
Scenar	io: Year 2035	Without Projec	t			Project	Name: k	inox B	lusiness P	ark	
Road Nam	e: I-215 NB F	мy				Job Ni	umber: 9	349			
Road Segme	nt: n/o Harley I	Knox Bl.									
SITE	SPECIFIC IN	PUT DATA				N	OISE M	ODE	L INPUT	S	
Highway Data				S	ite Con	ditions	(Hard =	10, So	oft = 15)		
Average Daily	Traffic (Adt):	69,400 vehicle	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A	xles):	15		
Peak H	lour Volume:	6,940 vehicle	s		He	avy Truc	ks (3+ A	xles):	15		
Ve	hicle Speed:	65 mph		V	ehicle l	Mix					
Near/Far La	ne Distance:	60 feet			Veh	icleType	I	Day	Evening	Night	Daily
Site Data						A	utos: 1	7.5%	12.9%	9.6%	93.82%
Ba	rrier Height	0.0 feet			Me	edium Tr	ucks: 8	34.8%	4.9%	10.3%	1.09%
Barrier Type (0-W	all. 1-Berm):	0.0			ŀ	leavy Tr	ucks: 8	86.5%	2.7%	10.8%	5.09%
Centerline Di	st. to Barrier:	100.0 feet			0.			11-1	- 41		
Centerline Dist.	to Observer:	100.0 feet		N	oise so	ource El	evations		et)		
Barrier Distance	to Observer:	0.0 feet			1 4 m - 1 m	Autos	. 0.0	00			
Observer Height (Above Pad):	5.0 feet			Mediui	TI Trucks	. 2.2	97	Grado Ad	iustmont	
Pa	ad Elevation:	0.0 feet			neav	y mucks	. 0.0	04	Graue Au	usunen	. 0.0
Roa	ad Elevation:	0.0 feet		L	ane Eq	uivalent	Distanc	e (in f	'eet)		
1	Road Grade:	0.0%				Autos	: 95.5	25			
	Left View:	-90.0 degre	es		Mediu	m Trucks	: 95.4	32			
	Right View:	90.0 degre	es		Heav	y Trucks	: 95.4	41			
FHWA Noise Mod	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresne	el .	Barrier Att	en Ber	m Atten
Autos:	74.55	4.70		-4.32		-1.20	-	4.77	0.0	000	0.00
Medium Trucks:	84.86	-14.67		-4.31		-1.20	-	4.88	0.0	000	0.00
Heavy Trucks:	88.18	-7.95		-4.31		-1.20	-	5.16	0.0	000	0.00
Unmitigated Noise	e Levels (with	out Topo and	barrie	er attenu	ation)						
VehicleType	Leq Peak Hou	r Leq Day	/	Leq Eve	ening	Leq I	Vight		Ldn	C	NEL
Autos:	73	.7	71.8		70.1		64.0		72.6	6	73.
Medium Trucks:	64	.7	63.2		56.8		55.3		63.7	7	64.
Heavy Trucks:	74	.7	73.3		64.3		65.5		73.9	9	74.
Vehicle Noise:	77	.5	75.9		71.2		68.1		76.5	5	76.9
Centerline Distan	ce to Noise Co	ontour (in feet)								
			L	70 dl	BA	65 0	1BA	6	0 dBA	55	dBA
			Ldn:	273	3	58	37		1,265	2,	726
		~ ~		007		~ ~ ~	0		1 '2'2'2	~	*****

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	FHW	/A-RD-77-108 H	IIGHW.	AY N	OISE PI	REDICT	ION MO	DDEL			
Scenari	o: Year 2035 V	Vithout Project				Project	Name:	Knox E	Business P	ark	
Road Nam	e: I-215 NB Fw	/y				Job N	lumber:	9349			
Road Segmer	it: s/o Harley K	nox BI.									
SITES	SPECIFIC IN	PUT DATA					OISE	MODE	L INPUT	S	
Highway Data				5	Site Cor	ditions	(Hard	= 10, So	oft = 15)		
Average Daily	Traffic (Adt):	52,900 vehicles						Autos:	15		
Peak Hour	Percentage:	10%			Me	dium Tr	ucks (2	Axles):	15		
Peak H	our Volume:	5,290 vehicles			He	avy Tru	cks (3+	Axles):	15		
Vei	hicle Speed:	65 mph		1	/ehicle	Mix					
Near/Far Lar	ne Distance:	60 feet			Veh	icleTvpe	e	Dav	Evenina	Niaht	Dailv
Site Data							Autos:	77.5%	12.9%	9.6%	93.82%
Bar	rier Height	0.0 feet			М	edium T	rucks:	84.8%	4.9%	10.3%	1.09%
Barrier Type (0-W	all, 1-Berm):	0.0			I	Heavy T	rucks:	86.5%	2.7%	10.8%	5.09%
Centerline Dis	t. to Barrier:	100.0 feet			Voise Se	ource E	levatio	ns (in fe	eet)		
Centerline Dist.	to Observer:	100.0 feet				Auto	IS' (000	,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck	·s· 2	297			
Observer Height (Above Pad):	5.0 feet			Heav	v Truck	's: 8	.004	Grade Ad	justment	: 0.0
Pa	d Elevation:	0.0 feet				,				·	
Roa	d Elevation:	0.0 feet		L	.ane Eq	uivalen	t Distai	nce (in i	feet)		
F	Road Grade:	0.0%				Auto	s: 95	5.525			
	Left View:	-90.0 degrees			Mediu	m Truck	:s: 95	5.432			
	Right View:	90.0 degrees			Heav	/y Truck	:s: 95	5.441			
FHWA Noise Mode	el Calculations										
VehicleType	REMEL	Traffic Flow	Distar	ice	Finite	Road	Fres	inel	Barrier Att	ten Bei	rm Atten
Autos:	74.55	3.52		-4.32	2	-1.20		-4.77	0.0	000	0.000
Medium Trucks:	84.86	-15.85		-4.31		-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	88.18	-9.13		-4.31		-1.20		-5.16	0.0	000	0.000
Unmitigated Noise	e Levels (witho	out Topo and b	arrier a	atten	uation)						
VehicleType	Leq Peak Hou	r Leq Day	Le	eq Ev	rening	Leq	Night		Ldn	С	NEL
Autos:	72.	5 7	0.6		68.9		62	.8	71.5	5	72.1
Medium Trucks:	63.	5 6	2.0		55.6		54	.1	62.6	6	62.8
Heavy Trucks:	73.	5 7	2.1		63.1		64	.3	72.1	7	72.8
Vehicle Noise:	76.	3 7	4.7		70.1		66	.9	75.4	4	75.3
Centerline Distanc	e to Noise Co	ntour (in feet)		70		05					10.4
		,		10 0	IBA 7	65	aBA 00	t	1 056	55	OBA 075
				22	0	4	30		1,000	2,	215
		CN	=L.:	23	э	5	10		1,111	2,	394

	FHW	/A-RD-77-108	HIGH	WAY N	IOISE P	REDICT	ION MO	DDEL			
Scenar Road Narr Road Segme	io: Year 2035 V ne: Harley Knox nt: e/o Harvill A	Vithout Projec BI. v.	t			Project Job N	Name: lumber:	Knox 9349	Business P	ark	
SITE	SPECIFIC IN	PUT DATA					OISE	MODE	L INPUT	S	
Highway Data				1	Site Cor	nditions	(Hard	= 10, S	oft = 15)		
Average Daily Peak Hour Peak H	Traffic (Adt): Percentage: lour Volume:	34,000 vehicle 10% 3,400 vehicle	es s		Me He	edium Tr eavy Tru	ucks (2 cks (3+	Autos: Axles): Axles):	15 15 15		
Ve	hicle Speed:	45 mph			Vehicle	Mix					
Near/Far La	ne Distance:	54 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data				-			Autos:	77.5%	5 12.9%	9.6%	93.82%
Ba	rrier Height	0.0 feet			М	ledium T	rucks:	84.8%	4.9%	10.3%	1.09%
Barrier Type (0-W	/all, 1-Berm):	0.0				Heavy T	rucks:	86.5%	2.7%	10.8%	5.09%
Centerline Di	st. to Barrier:	100.0 feet		1	Noise S	ource E	levatio	ns (in f	eet)		
Centerline Dist.	to Observer:	100.0 feet				Auto	s: C	.000	,		
Barrier Distance	to Observer:	0.0 feet			Mediu	m Truck	s: 2	.297			
Observer Height	(Above Pad):	5.0 feet			Hea	vv Truck	's: 8	3.004	Grade Ad	iustmen	t: 0.0
Pi	ad Elevation:	0.0 feet		H							
Ro	ad Elevation:	0.0 feet		1	Lane Eq	uivalen	t Dista	nce (in	feet)		
	Road Grade:	0.0%				Auto	s: 96	6.416			
	Left View:	-90.0 degre	es		Mediu	m Truck	's: 96	5.324			
	Right View:	90.0 degre	es		Hear	vy Truck	's: 96	6.333			
FHWA Noise Mod	el Calculations	;									
VehicleType	REMEL	Traffic Flow	Dista	ance	Finite	Road	Fres	snel	Barrier Att	en Be	rm Atten
Autos:	68.46	3.20		-4.38	В	-1.20		-4.77	0.0	000	0.000
Medium Trucks:	79.45	-16.17		-4.3	7	-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	84.25	-9.45		-4.38	В	-1.20		-5.16	0.0	000	0.000
Unmitigated Nois	e Levels (witho	out Topo and	barrier	r atten	uation)						
VehicleType	Leq Peak Hou	r Leq Day	· .	Leq E	vening	Leq	Night		Ldn	0	NEL
Autos:	66.	1	64.2		62.4		56	.4	65.0)	65.6
Medium Trucks:	57.	7	56.2		49.8		48	.3	56.8	3	57.0
Heavy Trucks:	69.	2	67.8		58.8		60	.0	68.4	1	68.5
Vehicle Noise:	71.	1	69.6		64.1		61	.8	70.2	2	70.5
Centerline Distan	ce to Noise Co	ntour (in feet)								
				70 c	:IBA	65	dBA		60 dBA	55	5 dBA
			Ldn:	10)3	2	22		479	1	,033
		C	VEL:	10)8	2	32		500	1	,078

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	FH\	WA-RD-77-10	BHIGH	WAY N	OISE PI	REDICTIC	N MODE			
Scenai Road Nan Road Segme	io: Year 2035 ne: Harley Kno nt: e/o I-215 S	Without Proje ox Bl. B Fwy Ramps	st			Project N Job Nui	lame: Kno mber: 934	ox Business Pa 19	ark	
SITE	SPECIFIC IN	NPUT DATA				NC	DISE MO	DEL INPUTS	5	
Highway Data				S	Site Cor	ditions (F	Hard = 10,	Soft = 15)		
Average Daily	Traffic (Adt):	28,000 vehic	es				Aut	os: 15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 Axle	es): 15		
Peak H	lour Volume:	2,800 vehicle	s		He	avy Truck	s (3+ Axle	es): 15		
Ve	hicle Speed:	45 mph		L.	/ehicle	Mix				
Near/Far La	ne Distance:	54 feet		-	Veh	icleTvpe	Da	v Evenina	Niaht	Dailv
Site Data						AL	itos: 77.	5% 12.9%	9.6%	93.82%
Ba	rrier Heiaht:	0.0 feet			М	edium Tru	cks: 84.	8% 4.9%	10.3%	1.09%
Barrier Type (0-V	Vall, 1-Berm):	0.0			I	Heavy Tru	cks: 86.	5% 2.7%	10.8%	5.09%
Centerline Di	ist. to Barrier:	100.0 feet		٨	Voise Se	ource Ele	vations (i	n feet)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.000		-	
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.297			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.004	Grade Adj	ustment:	0.0
P	ad Elevation:	0.0 feet		-		,				
Ro	ad Elevation:	0.0 feet		L	.ane Eq	uivalent l	Distance (in feet)		
	Road Grade:	0.0%				Autos:	96.416			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	96.324			
	Right View:	90.0 degre	es		Heav	/y Trucks:	96.333	5		
FHWA Noise Mod	lel Calculation	IS								
VehicleType	REMEL	Traffic Flow	Dist	tance	Finite	Road	Fresnel	Barrier Atte	en Ber	m Atten
Autos:	68.46	2.36		-4.38	3	-1.20	-4.	77 0.0	00	0.000
Medium Trucks:	79.45	-17.01		-4.37	,	-1.20	-4.	88 0.0	100	0.000
Heavy Trucks:	84.25	-10.30		-4.38	3	-1.20	-5.	16 0.0	100	0.000
Unmitigated Nois	e Levels (with	out Topo and	l barrie	r atteni	uation)					
VehicleType	Leq Peak Hou	ur Leq Da	y	Leq Ev	rening	Leq N	ight	Ldn	CI	VEL
Autos:	65	5.2	63.3		61.6		55.5	64.1		64.7
Medium Trucks:	56	3.9	55.4		49.0		47.4	55.9	1	56.1
Heavy Trucks:	68	3.4	67.0		57.9		59.2	67.5	;	67.7
Vehicle Noise:	70).3	68.7		63.3		60.9	69.4	٢	69.6
Centerline Distan	ce to Noise C	ontour (in fee	t)							
			. L	70 d	IBA	65 dl	BA	60 dBA	55	dBA
			Ldn:	91	1	195	5	421	9	07
		C	NEL:	95	ō	204	ŀ	440	9	47

Scenario Bood Norm	o: Year 2035 V	Vithout Project			Project Na	me: Kno	x Business F	Park	
Road Segmen	t: e/o I-215 NE	ы. 3 Fwy Ramps			JOD NUM	Der. 934	9		
SITE S	PECIFIC IN	PUT DATA		1	NOI	SE MO	DEL INPUT	S	
Highway Data				Site Con	ditions (Ha	ard = 10,	Soft = 15)		
Average Daily 1	raffic (Adt):	36,400 vehicles				Aut	os: 15		
Peak Hour I	Percentage:	10%		Me	dium Truck	s (2 Axle	s): 15		
Peak Ho	our Volume:	3,640 vehicles		He	avy Trucks	(3+ Axle	es): 15		
Veh	icle Speed:	45 mph		Vehicle I	Mix				
Near/Far Lan	e Distance:	54 feet		Veh	icleType	Da	v Evening	Night	Daily
Site Data					Auto	os: 77.	5% 12.9%	9.6%	93.82
Bar	rier Height:	0.0 feet		Me	edium Truci	ks: 84.	8% 4.9%	10.3%	1.099
Barrier Type (0-Wa	all. 1-Berm):	0.0		ŀ	leavy Truck	ks: 86.	5% 2.7%	10.8%	5.09
Centerline Dis	t. to Barrier:	100.0 feet		Noiso Se	urco Elov	ations (i	n foot)		
Centerline Dist. t	o Observer:	100.0 feet		110/36 30	Autos:	0.000	ii ieei)		
Barrier Distance t	o Observer:	0.0 feet		Mediu	n Trucks:	2 297			
Observer Height (A	Above Pad):	5.0 feet		Heav	v Trucks:	8.004	Grade Ac	liustment	: 0.0
Pa	d Elevation:	0.0 feet			,			,	
Roa	d Elevation:	0.0 feet		Lane Eq	uivalent Di	stance ('in feet)		
F	load Grade:	0.0%			Autos:	96.416			
	Left View:	-90.0 degrees		Mediui	m Trucks:	96.324			
	Right View:	90.0 degrees		Heav	y Trucks:	96.333			
FHWA Noise Mode	I Calculations								
VehicleType	REMEL	Traffic Flow	Distance	Finite	Road I	Fresnel	Barrier At	ten Ber	m Atter
Autos:	68.46	3.50	-4	.38	-1.20	-4.	77 0.	000	0.00
Medium Trucks:	79.45	-15.87	-4	.37	-1.20	-4.8	88 0.	000	0.00
Heavy Trucks:	84.25	-9.16	-4	.38	-1.20	-5.	16 0.	000	0.00
Unmitigated Noise	Levels (witho	out Topo and ba	rrier atte	enuation)					
VehicleType	Leq Peak Hou	 Leq Day 	Leq	Evening	Leq Nig	ht	Ldn	C	NEL
Autos:	66	4 64.	5	62.7		56.7	65.	3	65
Medium Trucks:	58.	D 56.	5	50.1		48.6	57.	0	57
Heavy Trucks:	69.	5 68.	1	59.1		60.3	68.	7	68.
Vehicle Noise:	71	4 69.	9	64.4		62.1	70.	5	70
Centerline Distanc	e to Noise Co	ntour (in feet)	7	1 dBA	65 dB.	4	60 dBA	55	dBA
		I di	L	108	233	-	502	1 35	0.81
		1.01		11/12	2.0.0		. 11/2	L.	001

	FH	WA-RD-77-108	B HIGH	WAY NO	DISE PR	EDICTIC	N MODE	L		
Scenari Road Nam Road Segmer	io: Year 2035 ie: Oleander A nt: e/o Drivew	Without Projec Av. ay 6	t			Project N Job Nui	lame: Kn mber: 934	ox Business I 19	Park	
SITE	SPECIFIC IN	NPUT DATA				NC	DISE MO	DEL INPUT	rs	
Highway Data				S	ite Con	ditions (I	lard = 10	, Soft = 15)		
Average Daily Peak Hour Peak H Ve	Traffic (Adt): Percentage: lour Volume: hicle Speed:	6,600 vehicl 10% 660 vehicle 40 mph	es s		Med Hea	dium Truc avy Truck	Au ks (2 Axle s (3+ Axle	tos: 15 es): 15 es): 15		
Near/Far La	ne Distance:	36 feet		V	enicie i	nix oloTuno	De		Night	Deilu
Site Data					veni	cie rype Au	itos: 77	.5% 12.9%	9.6°	% 93.82%
Bar	rier Height:	0.0 feet			Me	dium Tru	cks: 84	.8% 4.9%	10.3	% 1.09%
Barrier Type (0-W	all, 1-Berm):	0.0			H	leavy Tru	cks: 86	.5% 2.7%	10.8	% 5.09%
Centerline Dis	st. to Barrier:	100.0 feet		N	loise So	urce Ele	vations (in feet)		
Centerline Dist. Barrier Distance Observer Height (. Pa Roa	to Observer: to Observer: Above Pad): ad Elevation: ad Elevation:	100.0 feet 0.0 feet 5.0 feet 0.0 feet		L	Mediur Heav ane Equ	Autos: n Trucks: y Trucks: uivalent l	0.000 2.297 8.004 Distance	Grade Ad	djustmei	nt: 0.0
	Left View: Right View:	0.0% -90.0 degre 90.0 degre	es es		Mediur Heav	n Trucks: y Trucks:	98.494 98.404 98.413	+ 1 3		
FHWA Noise Mode	el Calculation	IS								
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresnel	Barrier A	tten B	erm Atten
Autos:	50.51	-3.41		-4.52		-1.20	-4.	// U.	000	0.000
Heavy Trucks:	82.99	-16.06		-4.51		-1.20	-4. -5.	16 0.	.000	0.000
Unmitigated Noise	e Levels (with	out Topo and	barrie	r attenu	uation)					
VehicleType	Leq Peak Ho	ur Leq Daj	/	Leq Ev	ening	Leq N	ight	Ldn		CNEL
Autos:	57	' .4	55.5		53.7		47.7	56	.3	56.9
Medium Trucks:	49	9.2	47.7		41.4		39.8	48	.3	48.5
Heavy Trucks:	61	.2	59.8		50.8		52.0	60	.4	60.5
Vehicle Noise:	62	2.9	61.4		55.7		53.6	62	.0	62.3
Centerline Distant	ce to Noise C	ontour (in fee	t)						-	
				70 di	BA	65 dl	BA	60 dBA	5	i5 dBA
		-	Ldn:	29		63		136		292
		С	NEL:	30		66		141		304

	FH	WA-RD-77-108	3 HIGHV	VAY N	OISE P	REDICTIO	N MOD	EL			
Scena Road Nai Road Segme	rio: Year 2035 ne: Oleander ent: w/o Harvill	Without Projec Av. Av.	rt			Project N Job Nur	lame: Kr nber: 93	nox Busir 349	iess Parl	k	
SITE	SPECIFIC I	NPUT DATA				NC	ISE MO	DDEL IN	IPUTS		
Highway Data				S	Site Cor	nditions (H	lard = 1	0, Soft =	15)		
Average Daily	/ Traffic (Adt):	6.600 vehic	es				AL	itos: 1	5		
Peak Hou	r Percentage:	10%			Me	dium Truc	ks (2 Ax	<i>les):</i> 1	5		
Peak	Hour Volume:	660 vehicle	s		He	avy Truck	s (3+ Ax	les): 1	5		
V	ehicle Speed:	40 mph			lahiala	Miy					
Near/Far L	ane Distance:	36 feet			Voh	icleType	0	av Ev	onina N	liaht	Daily
Site Data					VCI	A	itos: 7	7.5% 1	2.9%	9.6%	93.82%
Dito Dutu	arriar Haight	0.0 (act			М	edium Tru	cks: 84	4.8%	4.9%	10.3%	1.09%
Barrier Type (0-1	Mall 1-Borm):	0.0 1001				Heavy Tru	cks: 8	6.5%	2.7%	10.8%	5.09%
Centerline D	hist. to Barrier:	100.0 feet		-							
Centerline Dist	to Observer:	100.0 feet		^	ioise Si	ource Ele	vations	(in feet)			
Barrier Distance	to Observer:	0.0 feet				Autos:	0.00	0			
Observer Height	(Above Pad):	5.0 feet			Mediu	m Trucks:	2.29	17 	do Adius	-	0.0
F	Pad Elevation:	0.0 feet			Heav	/y Trucks:	8.00	4 G/a	ue Aujus	sunent.	0.0
Ro	ad Elevation:	0.0 feet		L	.ane Eq	uivalent L	Distance	(in feet))		
	Road Grade:	0.0%				Autos:	98.49	94			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	98.40)4			
	Right View:	90.0 degre	es		Heav	/y Trucks:	98.41	3			
FHWA Noise Mod	del Calculation	15									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresne	Ban	rier Atten	Berr	m Atten
Autos	66.51	-3.41		-4.52	2	-1.20	-4	1.77	0.000	0	0.000
Medium Trucks	: 77.72	-22.78		-4.51		-1.20	-4	1.88	0.000	C	0.000
Heavy Trucks	: 82.99	-16.06		-4.51		-1.20	-5	5.16	0.000	C	0.000
Unmitigated Nois	se Levels (with	nout Topo and	barrier	attenu	uation)						
VehicleType	Leq Peak Ho	ur Leq Da	y I	Leq Ev	rening	Leq N	ight	Ldr	7	CI	IEL
Autos	: 5	7.4	55.5		53.7		47.7		56.3		56.9
Medium Trucks	: 4	9.2	47.7		41.4		39.8		48.3		48.5
Heavy Trucks	6	1.2	59.8		50.8		52.0		60.4		60.5
Vehicle Noise	: 6	2.9	61.4		55.7		53.6		62.0		62.3
Centerline Distar	nce to Noise C	ontour (in fee	t)								
				70 d	BA	65 dl	BA	60 dl	3A	55	dBA
			Ldn:	29)	63		136	; ;	2	92
		C	NEL:	30)	66		141	í.	3	04

Monday, June 08, 2015

Monday, June 08, 2015

	FH	WA-RD-77-10	8 HIGH	IWAY N	IOISE PI	REDICTIO	N MODE	L		
Scenai Road Nan Road Segme	rio: Year 2035 ne: Harvill Av. nt: s/o Harley	With Project Knox Bl.				Project N Job Nur	lame: Kno mber: 934	ox Business P 19	'ark	
SITE	SPECIFIC II	NPUT DATA				NC	DISE MO	DEL INPUT	S	
Highway Data				4	Site Cor	nditions (H	lard = 10	Soft = 15)		
Average Daily	Traffic (Adt):	25,413 vehic	cles				Aut	os: 15		
Peak Hour	Percentage:	10%			Me	edium Truc	sks (2 Axle	es): 15		
Peak H	lour Volume:	2,541 vehicl	es		He	eavy Truck	s (3+ Axle	es): 15		
Ve	ehicle Speed:	50 mph			Vehicle	Mix				-
Near/Far La	ne Distance:	48 feet		F	Veh	icleType	Da	y Evening	Night	Daily
Site Data						Au	itos: 77	5% 12.9%	9.69	% 91.25%
Ba	rrier Height:	0.0 feet			М	edium Tru	cks: 84	8% 4.9%	10.3	% 1.67%
Barrier Type (0-V	Vall, 1-Berm):	0.0			1	Heavy Tru	cks: 86	5% 2.7%	10.89	% 7.08%
Centerline Di	ist. to Barrier:	100.0 feet		1	Noise Se	ource Ele	vations (i	n feet)		
Centerline Dist.	to Observer:	100.0 feet				Autos:	0.000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.297			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.004	Grade Ad	justmer	nt: 0.0
P	ad Elevation:	0.0 feet		-					·	
Ro	ad Elevation:	0.0 feet		4	Lane Eq	uivalent L	Distance	(in feet)		
	Road Grade:	0.0%				Autos:	97.206	i		
	Left View:	-90.0 degr	ees		Mediu	m Trucks:	97.115			
	Right View:	90.0 degr	ees		Heav	vy Trucks:	97.124	-		
FHWA Noise Mod	lel Calculatior	ıs								
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresnel	Barrier Att	en B	erm Atten
Autos:	70.20	1.3	6	-4.43	3	-1.20	-4.	77 0.0	000	0.000
Medium Trucks:	81.00	-16.0	2	-4.43	3	-1.20	-4.	88 0.0	000	0.000
Heavy Trucks:	85.38	-9.7	4	-4.4	3	-1.20	-5.	16 0.0	000	0.000
Unmitigated Nois	e Levels (with	nout Topo an	d barrie	er atten	uation)					
VehicleType	Leq Peak Ho	ur Leq Da	ay	Leq E	vening	Leq N	ight	Ldn	(CNEL
Autos:	65	5.9	64.0		62.3		56.2	64.	В	65.4
Medium Trucks:	59	9.4	57.8		51.5		49.9	58.4	4	58.6
Heavy Trucks:	70	0.0	68.6		59.5		60.8	69.3	2	69.3
Vehicle Noise:	71	1.7	70.2		64.4		62.3	70.8	В	71.0
Centerline Distan	ce to Noise C	ontour (in fee	et)			r				
			L	70 0	dBA	65 dE	BA	60 dBA	5	5 dBA
			Ldn:	11	13	243	3	523		1,127
		(CNEL:	11	17	253	3	544		1,172

	FHV	VA-RD-77-108	HIGH	IWAY NO	DISE PI	REDICT		DEL			
Scenari	o: Year 2035	With Project				Project	Name: k	(nox E	Business P	ark	
Road Nam	e: Harvill Av.					Job N	umber: 9	349			
Road Segmer	nt: n/o Oleand	er Av.									
SITE	SPECIFIC IN	IPUT DATA				N	IOISE N	ODE		S	
Highway Data				s	ite Con	ditions	(Hard =	10, Sc	oft = 15)		
Average Daily	Traffic (Adt):	25,413 vehicl	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tri	ucks (2 A	xles):	15		
Peak H	our Volume:	2,541 vehicle	s		He	avy Tru	cks (3+ A	xles):	15		
Vel	hicle Speed:	50 mph		V	ehicle	Mix					
Near/Far Lar	ne Distance:	48 feet			Veh	icleType		Day	Evening	Night	Daily
Site Data						/	Autos:	77.5%	12.9%	9.6%	91.25%
Bar	rier Heiaht:	0.0 feet			M	edium Ti	rucks:	34.8%	4.9%	10.3%	1.67%
Barrier Type (0-W	all, 1-Berm):	0.0			1	Heavy Ti	rucks:	36.5%	2.7%	10.8%	7.08%
Centerline Dis	t. to Barrier:	100.0 feet			laiaa C	NUTRO E	lovation	lin fe	an 41		
Centerline Dist.	to Observer:	100.0 feet		N	orse a	Auto	evalions	00	el)		
Barrier Distance t	o Observer:	0.0 feet			Madiu	Auto	s. 0.0	00			
Observer Height ()	Above Pad):	5.0 feet			Healu	Truck	s. 2.2	97	Grado Ad	iustmont	0.0
Pa	d Elevation:	0.0 feet			neav	у писк	s. o.u	04	Graue Au	usuneni.	0.0
Roa	d Elevation:	0.0 feet		L	ane Eq	uivalen	t Distanc	e (in i	feet)		
F	Road Grade:	0.0%				Auto	s: 97.2	06			
	Left View:	-90.0 degre	es		Mediu	m Truck	s: 97.1	15			
	Right View:	90.0 degre	es		Heav	ry Truck	s: 97.1	24			
FHWA Noise Mode	el Calculation	s									
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresn	e/	Barrier Att	en Ber	m Atten
Autos:	70.20	1.36		-4.43		-1.20		4.77	0.0	000	0.00
Medium Trucks:	81.00	-16.02		-4.43		-1.20		4.88	0.0	000	0.00
Heavy Trucks:	85.38	-9.74		-4.43		-1.20		5.16	0.0	000	0.00
Unmitigated Noise	Levels (with	out Topo and	barrie	er atteni	ation)						
VehicleType	Leq Peak Hou	ir Leq Day	/	Leq Ev	ening	Leq	Night		Ldn	CI	VEL
Autos:	65	.9	64.0		62.3		56.2		64.8	3	65.
Medium Trucks:	59	.4	57.8		51.5		49.9		58.4	1	58.
Heavy Trucks:	70	.0	68.6		59.5		60.8		69.2	2	69.
Vehicle Noise:	71	.7	70.2		64.4		62.3		70.8	3	71.
Centerline Distance	e to Noise Co	ontour (in fee)								
			L	70 di	BA	65	dBA	6	0 dBA	55	dBA
		-	Ldn:	113	3	2.	43		523	1,	127
		C	NH ·	113	,	2	6-14		544	1	1/2

Monday, June 08, 2015

	FHW	A-RD-77-108 H	IIGHV	AY N	OISE PI	REDICT		DDEL			_
Scenario Road Name Road Segment	: Year 2035 V : Harvill Av. : s/o Oleande	Vith Project r Av.				Project Job N	Name: lumber:	Knox E 9349	Business P	ark	
SITE S	PECIFIC INI	PUT DATA				N	IOISE	MODE		s	
Highway Data				5	Site Con	ditions	(Hard :	= 10, So	oft = 15)		
Average Daily T Peak Hour F Peak Ho	raffic (Adt): 2 Percentage: ur Volume: 2	28,902 vehicles 10% 2,890 vehicles	5		Me He	dium Tri avy Tru	ucks (2 cks (3+	Autos: Axles): Axles):	15 15 15		
Veh	icle Speed:	50 mph		1	/ehicle	Mix					
Near/Far Lan	e Distance:	48 feet		F	Veh	icleTvpe		Dav	Evenina	Night	Dailv
Site Data							Autos:	77.5%	12.9%	9.6%	93.75%
Barr Barrier Type (0-Wa	ier Height: II, 1-Berm):	0.0 feet 0.0			Me F	edium T Ieavy T	rucks: rucks:	84.8% 86.5%	4.9% 2.7%	10.3% 10.8%	1.10% 5.15%
Centerline Dist	to Barrier:	100.0 feet			Voise Sc	ource E	levatio	ns (in fe	pet)		
Centerline Dist. to	o Observer:	100.0 feet		-	10/30 00	Auto	c • 0	000			
Barrier Distance to	o Observer:	0.0 feet			Modiu	m Truck	o. 0	207			
Observer Height (A	bove Pad):	5.0 feet			Hoa	n Truck	з. <u>2</u> с. я	004	Grade Ad	iustment	0.0
Pad	d Elevation:	0.0 feet			near	y much	J. U	.004	,		
Road	d Elevation:	0.0 feet		L	.ane Eq	uivalen	t Distai	nce (in i	feet)		
R	oad Grade:	0.0%				Auto	s: 97	.206			
	Left View:	-90.0 degrees	5		Mediu	m Truck	s: 97	7.115			
	Right View:	90.0 degrees	6		Heav	ry Truck	s: 97	7.124			
FHWA Noise Mode	Calculations										
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fres	inel	Barrier Att	en Bei	rm Atten
Autos:	70.20	2.03		-4.43	3	-1.20		-4.77	0.0	000	0.000
Medium Trucks:	81.00	-17.25		-4.43	3	-1.20		-4.88	0.0	000	0.000
Heavy Trucks:	85.38	-10.57		-4.43	3	-1.20		-5.16	0.0	000	0.00
Unmitigated Noise	Levels (witho	out Topo and b	arrier	atten	uation)						
VehicleType I	.eq Peak Hour	· Leq Day	L	.eq Ev	rening	Leq	Night		Ldn	С	NEL
Autos:	66.6	6 6	4.7		62.9		56	.9	65.5	5	66.1
Medium Trucks:	58.1	1 5	6.6		50.2		48	.7	57.2	2	57.4
Heavy Trucks:	69.2	2 6	7.8		58.7		60	.0	68.3	3	68.
Vehicle Noise:	71.3	3 6	9.7		64.5		61	.9	70.4	4	70.3
Centerline Distance	e to Noise Co	ntour (in feet)		=			10.4				10.4
				/0 d	IBA 0	65	авА	6	IU dBA	55	aBA
		L	an:	10	6	2	28		491	1,	058
		CN	=L:	11	1	2	აძ		514	1,	106

	FH	WA-RD-77-108	BHIGH	WAY NO	DISE P	REDICTIC	N MODE	-	
Scenari Road Nam	o: Year 2035	With Project				Project N	lame: Kno	x Business P	ark
Road Segmen	nt: n/o Harley	Knox Bl.				000140	11001. 004	5	
SITES	SPECIFIC II	NPUT DATA				N	DISE MO	DEL INPUT	s
Highway Data				S	ite Col	nditions (l	Hard = 10,	Soft = 15)	
Average Daily	Traffic (Adt):	68,600 vehicl	es				Auto	os: 15	
Peak Hour	Percentage:	10%			Me	aium Truc	KS (2 AXIE	s): 15	
Peak H	our Volume:	6,860 vehicle	'S		He	eavy Truck	is (3+ Axle	s): 15	
Vel	hicle Speed:	65 mph		V	ehicle	Mix			
Near/Far Lar	ne Distance:	60 feet			Veł	nicleType	Daj	/ Evening	Night Daily
Site Data						AL	itos: 77.	5% 12.9%	9.6% 93.82%
Bar	rier Height:	0.0 feet			M	ledium Tru	icks: 84.	B% 4.9%	10.3% 1.09%
Barrier Type (0-W	all, 1-Berm):	0.0				Heavy Tru	icks: 86.	5% 2.7%	10.8% 5.09%
Centerline Dis	st. to Barrier:	100.0 feet		N	oise S	ource Ele	vations (il	1 feet)	
Centerline Dist.	to Observer:	100.0 feet				Autos	0.000	,	
Barrier Distance t	to Observer:	0.0 feet			Mediu	m Trucks:	2.297		
Observer Height (Above Pad):	5.0 feet			Hea	vy Trucks:	8.004	Grade Ad	iustment: 0.0
Pa	d Elevation:	0.0 feet					D/- / /	(m. f. m. et)	
Roa	d Elevation:	0.0 feet		Li	ane Eq	uivalent l	Distance (in teet)	
F	Road Grade:	0.0%				Autos:	95.525		
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.432		
	Right view:	90.0 degre	es		неа	vy Trucks:	95.441		
FHWA Noise Mode	el Calculation	15							
VehicleType	REMEL	Traffic Flow	Dist	ance	Finite	Road	Fresnel	Barrier Att	en Berm Atten
Autos:	74.55	4.65		-4.32		-1.20	-4.1	7 0.0	0.000
Medium Trucks:	84.86	-14.72		-4.31		-1.20	-4.8	38 0.0	000 0.000
Heavy Trucks:	88.18	-8.00		-4.31		-1.20	-5.	6 0.0	0.000
Unmitigated Noise	e Levels (with	nout Topo and	barrie	r attenu	ation)				-
VehicleType	Leq Peak Ho	ur Leq Daj	V	Leq Eve	ening	Leq N	light	Ldn	CNEL
Autos:	73	3.7	71.8		70.0		64.0	/2.0	5 73.2
Healum Trucks:	54	1.0	72.0		56.8	i 1	55.Z	53.	03.5
Vehicle Noise:	7	+. <i>1</i> 7.4	75.8		71.2	,	68.0	73.0	5 76.8
Centerline Distance	e to Noise C	ontour (in foo	e						
Genternine Distant		ontour (III lee	<i>y</i>	70 dE	BA	65 d	BA	60 dBA	55 dBA
			Ldn:	271		583	3	1,256	2,705
		С	NEL:	285	5	613	3	1,321	2,847

Monday, June 08, 2015

	FH	WA-RD-77-10		AY NO	DISE PI			EL _			
Scenar Road Nan Road Segme	io: Year 2035 ne: I-215 SB F nt: s/o Harley	With Project wy Knox Bl.				Project N Job Nur	ame: K nber: 9	nox B 349	usiness Pa	ark	
SITE	SPECIFIC II	NPUT DATA				NO	ISE M	ODEI	. INPUTS	5	
Highway Data				S	ite Con	ditions (H	lard = 1	10, So	ft = 15)		
Average Daily	Traffic (Adt):	62,823 vehic	es				Α	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Truc	ks (2 A)	des):	15		
Peak H	lour Volume:	6,282 vehicle	s		He	avy Truck	s (3+ A)	des):	15		
Ve	hicle Speed:	65 mph		V	ohiclo	Mix					
Near/Far La	ne Distance:	60 feet		-	Voh	icleType	1)av	Evening	Niaht	Daily
Site Data					10/1	Au	tos: 7	7.5%	12.9%	9.6%	93.61%
Ba	rrier Height	0.0 feet			M	edium Tru	cks: 8	4.8%	4.9%	10.3%	1.13%
Barrier Type (0-W	/all, 1-Berm):	0.0			ŀ	leavy Tru	cks: 8	6.5%	2.7%	10.8%	5.26%
Centerline Di	st. to Barrier:	100.0 feet		N	oise So	ource Elev	ations	(in fe	et)		
Centerline Dist.	to Observer:	100.0 feet		-		Autos:	0.0	00			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks:	2.2	97			
Observer Height	(Above Pad):	5.0 feet			Heav	v Trucks:	8.0	04	Grade Adi	ustment	: 0.0
P	ad Elevation:	0.0 feet				,					
Ro	ad Elevation:	0.0 feet		L	ane Eq	uivalent E	Distance	e (in f	eet)		
	Road Grade:	0.0%				Autos:	95.5	25			
	Left View:	-90.0 degre	es		Mediu	m Trucks:	95.4	32			
	Right View:	90.0 degre	es		Heav	ry Trucks:	95.4	41			
FHWA Noise Mod	el Calculatior	15									
VehicleType	REMEL	Traffic Flow	Dista	nce	Finite	Road	Fresne	e/ 1	Barrier Atte	en Ber	m Atten
Autos:	74.55	4.26		-4.32		-1.20	-	4.77	0.0	00	0.000
Medium Trucks:	84.86	-14.91		-4.31		-1.20	-	4.88	0.0	00	0.000
Heavy Trucks:	88.18	-8.25		-4.31		-1.20	-	5.16	0.0	00	0.000
Unmitigated Nois	e Levels (with	nout Topo and	barrier	attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Da	y L	eq Eve	ening	Leq Ni	ight		Ldn	C	NEL
Autos:	73	3.3	71.4		69.6		63.6		72.2		72.8
Medium Trucks:	64	4.4	62.9		56.6		55.0		63.5		63.7
Heavy Trucks:	74	4.4	73.0		64.0		65.2		73.6		73.7
Vehicle Noise:	77	7.1	75.5		70.8		67.7		76.2		76.5
Centerline Distan	ce to Noise C	ontour (in fee	t)								
				70 dł	BA	65 dE	BA	6	0 dBA	55	dBA
			Ldn:	258	3	557		1	,199	2,	583
		C	NEL:	272	2	585		1	,261	2,	717

	FHV	/A-RD-77-108	HIGH	WAY NC	DISE PF	REDICTI		EL			
Scenar	io: Year 2035 \	Vith Project				Project	Name: K	inox B	usiness P	ark	
Road Nan	ne: I-215 NB Fv	vy				Job N	umber: 9	349			
Road Segme	nt: n/o Harley H	(nox Bl.									
SITE	SPECIFIC IN	PUT DATA				N	OISE M	ODE		5	
Highway Data				Si	ite Con	ditions	(Hard = 1	10, So	oft = 15)		
Average Daily	Traffic (Adt):	70,553 vehicl	es				A	utos:	15		
Peak Hour	Percentage:	10%			Me	dium Tru	icks (2 A	kles):	15		
Peak H	lour Volume:	7,055 vehicle	s		He	avy Truc	ks (3+ A)	kles):	15		
Ve	hicle Speed:	65 mph		Ve	Vehicle Mix						
Near/Far La	ne Distance:	60 feet			Veh	icleTvpe	[Dav	Evenina	Niaht	Dailv
Site Data						A	utos: 7	7.5%	12.9%	9.6%	93.12%
Ba	rrier Height:	0.0 feet			Me	edium Tr	ucks: 8	4.8%	4.9%	10.3%	1.24%
Barrier Type (0-V	/all. 1-Berm):	0.0			ŀ	leavy Tr	ucks: 8	6.5%	2.7%	10.8%	5.63%
Centerline Di	st. to Barrier:	100.0 feet						() -	- 41		
Centerline Dist.	to Observer:	100.0 feet		190	Dise Sc	ource El	evations		et)		
Barrier Distance	to Observer:	0.0 feet			Madiuu	AUtos	. 0.0	00			
Observer Height	(Above Pad):	5.0 feet			Hoo	n mucks	. 2.2	97	Grada Ad	ustmont	. 0.0
P	ad Elevation:	0.0 feet			Tieav	y mucka	. 0.0	04	Grade Adj	usunem	. 0.0
Road Elevation: 0.0 feet					ane Eq	uivalent	Distance	e (in f	leet)		
	Road Grade:	0.0%				Autos	: 95.5	25			
	Left View:	-90.0 degre	es		Mediui	n Trucks	: 95.4	32			
	Right View:	90.0 degre	es		Heav	y Trucks	: 95.4	41			
FHWA Noise Mod	el Calculation	5									
VehicleType	REMEL	Traffic Flow	Disi	tance	Finite	Road	Fresne	e/ .	Barrier Att	en Ber	m Atten
Autos:	74.55	4.74		-4.32		-1.20	-	4.77	0.0	000	0.00
Medium Trucks:	84.86	-14.00		-4.31		-1.20	-	4.88	0.0	000	0.00
Heavy Trucks:	88.18	-7.44		-4.31		-1.20	-	5.16	0.0	000	0.00
Unmitigated Nois	e Levels (with	out Topo and	barrie	er attenu	ation)						
VehicleType	Leq Peak Hou	r Leq Day	r	Leq Eve	ening	Leq	Vight		Ldn	C	NEL
Autos:	73.	8	71.9		70.1		64.0		72.7	,	73.3
Medium Trucks:	65.	3	63.8		57.5		55.9		64.4	Ļ	64.0
Heavy Trucks:	75.	2	73.8		64.8		66.0		74.4	ŀ	74.
Vehicle Noise:	77.	8	76.2		71.4		68.4		76.9)	77.:
Centerline Distan	ce to Noise Co	ntour (in feet)		,						
				70 dE	BA	65 (1BA	6	0 dBA	55	dBA
			Ldn:	287		61	8		1,332	2,	869

	FH\	WA-RD-77-108	HIGH	IWAY N	NOISE P	REDICT	ION MOI	DEL				
Scenario: Road Name: Road Segment:	Year 2035 I-215 NB F s/o Harley	With Project wy Knox BI.			Project Name: Knox Business Park Job Number: 9349							
SITE SP	ECIFIC IN	IPUT DATA			NOISE MODEL INPUTS							
Highway Data Average Daily Tra Peak Hour Pe	affic (Adt): rcentage:	52,900 vehicl 10%	es		Autos: 15 Medium Trucks (2 Axles): 15 Heavy Trucks (2 Axles): 15							
Vehici Near/Far Lane	le Speed: Distance:	65 mph 60 feet			Vehicle Veł	Mix nicleType))	Day	Evening	Night	Daily	
Site Data						4	Autos:	77.5%	12.9%	9.6%	93.82%	
Barrie Barrier Type (0-Wall,	r Height: 1-Berm):	0.0 feet 0.0			М	edium Ti Heavy Ti	rucks: rucks:	84.8% 86.5%	4.9% 2.7%	10.3% 10.8%	1.09% 5.09%	
Centerline Dist. t	to Barrier:	100.0 feet			Noise S	ource El	levation	s (in fe	eet)			
Barrier Distance to Observer Height (Ab Pad I	Observer: Observer: ove Pad): Elevation:	100.0 feet 0.0 feet 5.0 feet 0.0 feet		-	Autos: 0.000 Medium Trucks: 2.297 Heavy Trucks: 8.004 Grade Adjustment: 0.0						t: 0.0	
Road	Elevation:	0.0 feet		ŀ		Auto	e 05 /	525	eei)			
R	Left View: ight View:	-90.0 degre 90.0 degre	es es		Mediu Hea	m Truck vy Truck	s: 95.4 s: 95.4	132 141				
FHWA Noise Model (Calculation	s										
VehicleType	REMEL	Traffic Flow	Dis	tance	Finite	Road	Fresn	el	Barrier Att	en Be	rm Atten	
Autos: Medium Trucks:	74.55 84.86	3.52 -15.85		-4.3 -4.3	2 1	-1.20 -1.20		-4.77 -4.88	0.0	000	0.000	
Heavy Trucks:	88.18	-9.13		-4.3	1	-1.20		-5.16	0.0	000	0.000	
Unmitigated Noise L	evels (with	out Topo and	barrie	er atter	nuation)							
VehicleType Le	q Peak Ho	ur Leq Day	V	Leq E	vening	Leq	Night		Ldn	С	NEL	
Autos:	72	2.5	70.6		68.9		62.8		71.5	5	72.1	
Medium Trucks:	63	1.5	62.0		55.6		54.1		62.6	6	62.8	
Vehicle Noise:	73	i.ə i.3	72.1 74.7		63.1 70.1		66.9		72.7	r 1	72.8	
Centerline Distance	to Noise C	ontour (in feet	f)									
2 Distance			/	70	dBA	65	dBA	6	0 dBA	55	i dBA	
		C	Ldn: NEL:	23	27 39	4 5	90 16		1,056 1,111	2	,275 ,394	

	FH	WA-RD-77-10	3 HIGHW	AY NO	JISE PI	REDICTIO	IN MODE	L				
Scena	rio: Year 2035	With Project				Project N	lame: Kn	ox Business	Park		-	
Road Nar	ne: Harley Kno	ox Bl.				Job Nu	nber: 934	19				
Road Segme	ent: e/o Harvill	Av.										
SITE	SPECIFIC I	NPUT DATA				NC	ISE MO	DEL INPU	тs			
Highway Data				S	Site Conditions (Hard = 10, Soft = 15)							
Average Daily	Traffic (Adt):	35,813 vehic	les				Aut	os: 15	-			
Peak Hou	r Percentage:	10%			Me	dium Truc	ks (2 Axle	es): 15				
Peak I	Hour Volume:	3,581 vehicle	es		He	avy Truck	s (3+ Axle	es): 15				
Ve	ehicle Speed:	45 mph		V	ohiolo	Miy						
Near/Far La	ane Distance:	54 feet			Voh	icleType	Da	v Evenin	a Ni	iaht	Daily	
Site Data					VCII	A	105' 77	5% 12.99	<i>y w</i>	9.6%	92.00%	
Dito Duta		0.0 ()			М	edium Tru	cks: 84	8% 4.9	% 10	0.3%	1.50%	
Barrior Type (0.1	Moll 1 Porm):	0.0 feet			1	Heavv Tru	cks: 86	5% 2.7	% 10	0.8%	6.50%	
Contorlino D	vall, 1-Dellin).	100.0 foot										
Centerline Dist	to Observer:	100.0 feet		N	oise So	ource Ele	vations (i	n feet)				
Barrier Distance	to Observer:	0.0 feet				Autos:	0.000					
Observer Height	(Above Pad):	5.0 feet			Mediu	m Trucks:	2.297	·				
F	Pad Elevation:	0.0 feet			Heav	/y Trucks:	8.004	Grade	Adjusti	ment:	0.0	
Ro	ad Elevation:	0.0 feet		Li	ane Eq	uivalent L	Distance	(in feet)				
	Road Grade:	0.0%				Autos:	96.416	;				
	Left View:	-90.0 deare	es		Mediu	m Trucks:	96.324	L.				
	Right View:	90.0 degre	es		Heav	/y Trucks:	96.333	5				
		-										
FHWA Noise Mod	lel Calculation	ns	0 1.1		F 1 11				A			
Venicle I ype	REMEL	I raffic Flow	Dista	nce	Finite	Road	Fresnei	Barrier	Atten	Beri	m Atten	
Autos:	68.40	. 3.34		-4.38		-1.20	-4.	//	0.000		0.000	
Medium Trucks:	79.45	-14.54		-4.37		-1.20	-4.	88	0.000		0.000	
Heavy Trucks:	84.25	-8.17		-4.38		-1.20	-5.	10	J.000		0.000	
Unmitigated Nois	e Levels (with	hout Topo and	l barrier	attenu	ation)							
VehicleType	Leq Peak Ho	our Leq Da	y L	.eq Eve	ening	Leq N	ight	Ldn		CI	VEL	
Autos:	6	6.2	64.3		62.6		56.5	6	5.1		65.7	
Medium Trucks:	5	9.3	57.8		51.5		49.9	5	8.4		58.6	
Heavy Trucks:	7	0.5	69.1		60.1		61.3	6	9.7		69.8	
Vehicle Noise:	7	2.1	70.6		64.7		62.8	7	1.2		71.5	
Centerline Distan	ice to Noise C	contour (in fee	t)						-			
				70 dE	BA	65 dl	BA	60 dBA		55	dBA	
			Ldn:	120)	259)	558		1,2	202	
		C	NEL:	125	;	269)	580		1,2	250	

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	FH	WA-RD-77-1	08 HIG	HWAY I	NOISE P	REDICTI	ON MOI	DEL			
Scenar Road Nan Road Segme	rio: Year 2035 ne: Harley Kno nt: e/o I-215 \$	With Project ox Bl. SB Fwy Ramp	s			Project Job Ni	Name: H umber: S	<nox 9349</nox 	Business Pa	ırk	
SITE	SPECIFIC I	NPUT DAT	1		NOISE MODEL INPUTS						
Highway Data					Site Cor	nditions	(Hard =	10, S	oft = 15)		
Average Daily	Traffic (Adt):	29,390 vehi	cles				1	Autos.	15		
Peak Hour	Percentage:	10%			Me	edium Tru	icks (2 A	xles).	: 15		
Peak H	lour Volume:	2,939 vehic	les		He	eavy Truc	:ks (3+ A	xles).	: 15		
Ve	hicle Speed:	45 mph		ŀ	Vehicle	Mix					
Near/Far La	ne Distance:	54 feet		ŀ	Veł	nicleType		Day	Evening	Night	Daily
Site Data						A	lutos:	77.5%	6 12.9%	9.6%	92.06%
Ba	rrier Heiaht:	0.0 feet			M	ledium Tr	ucks:	84.8%	6 4.9%	10.3%	1.49%
Barrier Type (0-V	Vall, 1-Berm):	0.0				Heavy Tr	ucks:	86.5%	6 2.7%	10.8%	6.46%
Centerline Di	ist. to Barrier:	100.0 feet		ŀ	Noise S	ource El	evations	s (in f	eet)		
Centerline Dist.	to Observer:	100.0 feet				Autos	s: 0.0	000			
Barrier Distance	to Observer:	0.0 feet			Mediu	m Trucks	: 2.2	97			
Observer Height	(Above Pad):	5.0 feet			Hea	vv Trucks	s: 8.0	004	Grade Adju	ustment	: 0.0
P	ad Elevation:	0.0 feet		-							
Ro	ad Elevation:	0.0 feet		-	Lane Eq	uivalent	Distanc	ce (in	feet)		
	Road Grade:	0.0%				Autos	s: 96.4	416			
	Left View:	-90.0 deg	rees		Mediu	m Trucks	s: 96.3	324			
	Right View:	90.0 deg	rees		Hea	vy Trucks	s: 96.3	333			
FHWA Noise Mod	lel Calculation	ns		l							
VehicleType	REMEL	Traffic Flow	ı Di	stance	Finite	Road	Fresn	el	Barrier Atte	en Bei	rm Atten
Autos:	68.46	3 2.4	9	-4.3	38	-1.20		-4.77	0.0	00	0.000
Medium Trucks:	79.45	5 -15.4	4	-4.3	37	-1.20		-4.88	0.0	00	0.000
Heavy Trucks:	84.25	5 -9.0	16	-4.3	38	-1.20		-5.16	0.0	00	0.000
Unmitigated Nois	e Levels (witl	hout Topo ar	d barr	ier attei	nuation)						
VehicleType	Leq Peak Ho	ur Leq D	ay	Leq E	vening	Leq	Night		Ldn	С	NEL
Autos:	6	5.4	63.5		61.7		55.6		64.3		64.9
Medium Trucks:	5	8.4	56.9		50.6		49.0		57.5		57.7
Heavy Trucks:	6	9.6	68.2		59.2		60.4		68.8		68.9
Vehicle Noise:	7	1.2	69.7		63.8		61.9		70.3		70.6
Centerline Distan	ce to Noise C	contour (in fe	et)								
			l	70	dBA	65 0	dBA		60 dBA	55	dBA
			Ldn:	1	05	22	26		487	1,	050
			CNEL:	1	09	23	35		507	1,	092

	FHV	VA-KD-77-108	HIGH	1WAT N	IOISE PR	EDICTIC		JEL				
Scenario	p: Year 2035	With Project			Project Name: Knox Business Park							
Road Name	e: Harley Kno	K BI.				Job Nu	mber: 9	349				
Road Segmen	t: e/o I-215 N	B Fwy Ramps										
SITE S	PECIFIC IN	PUT DATA			NOISE MODEL INPUTS							
Highway Data				5	Site Con	ditions (Hard =	10, So	oft = 15)			
Average Daily 1	raffic (Adt):	36,637 vehicle	es				/	Autos:	15			
Peak Hour I	Percentage:	10%			Me	dium True	cks (2 A	xles):	15			
Peak Ho	our Volume:	3,664 vehicle	s		He	avy Truck	ks (3+ A	xles):	15			
Veh	icle Speed:	45 mph		1	Vehicle I	<i>lix</i>						
Near/Far Lan	e Distance:	54 feet			Veh	cleType		Day	Evening	Night	Daily	
Site Data						A	utos:	77.5%	12.9%	9.6%	93.75%	
Bar	rier Heiaht:	0.0 feet			Me	edium Tru	icks:	84.8%	4.9%	10.3%	1.10%	
Barrier Type (0-Wa	all, 1-Berm):	0.0			ŀ	leavy Tru	icks:	86.5%	2.7%	10.8%	5.14%	
Centerline Dis	t. to Barrier:	100.0 feet		1	Voise Sc	urce Ele	vations	in fe	et)			
Centerline Dist. t	o Observer:	100.0 feet				Autos	0.0	00				
Barrier Distance t	o Observer:	0.0 feet			Mediur	n Trucks	2.2	97				
Observer Height (A	Above Pad):	5.0 feet			Heav	v Trucks	8.0	04	Grade Ad	iustment	: 0.0	
Pa	d Elevation:	0.0 feet				,						
Roa	d Elevation:	0.0 feet		1	Lane Eq	uivalent	Distand	e (in	feet)			
F	oad Grade:	0.0%				Autos:	96.4	16				
	Left View:	-90.0 degree	es		Mediur	n Trucks:	96.3	324				
	Right View:	90.0 degree	es		Heav	y Trucks:	96.3	333				
FHWA Noise Mode	I Calculation	s										
VehicleType	REMEL	Traffic Flow	Dis	stance	Finite	Road	Fresn	el	Barrier Att	en Ber	m Atten	
Autos:	68.46	3.52		-4.38	3	-1.20		4.77	0.0	000	0.00	
Medium Trucks:	79.45	-15.78		-4.37	7	-1.20		4.88	0.0	000	0.00	
Heavy Trucks:	84.25	-9.08		-4.38	3	-1.20		-5.16	0.0	000	0.00	
Unmitigated Noise	Levels (with	out Topo and	barrie	er atten	uation)							
VehicleType	Leq Peak Hou	r Leq Day	'	Leq Ev	/ening	Leq N	light		Ldn	C	NEL	
Autos:	66	.4	64.5		62.7		56.7		65.3	3	65.	
Medium Trucks:	58	.1	56.6		50.2		48.7		57.1	1	57.	
Heavy Trucks:	69	.6	68.2		59.1		60.4		68.	7	68.	
Vehicle Noise:	71	.5	69.9		64.5		62.1		70.6	6	70.	
Centerline Distanc	e to Noise Co	ontour (in feet)	70 -	1RA	65 4	RΔ	6	O dBA	55	dBA	
			I dn	10	0	23	5	L L	506	1 30	001	
		0	VEL ·	10	1	23	5		528	1,	138	
		0	¥66.		-	24			520	1,	100	

	FH	WA-RD-77-108	HIGH	WAY NO	DISE P	REDICTI	ON MOI	DEL			
Scenari Road Nam Road Segmen	o: Year 2035 e: Oleander A nt: e/o Drivew	With Project w. ay 6			Project Name: Knox Business Park Job Number: 9349						
SITE S	SPECIFIC II	IPUT DATA			NOISE MODEL INPUTS						
Highway Data				S	ite Cor	nditions	(Hard =	10, So	ft = 15)		
Average Daily	Traffic (Adt):	8,715 vehicl	es				A	Autos:	15		
Peak Hour	Percentage:	10%			Me	edium Tru	icks (2 A	xles):	15		
Peak H	our Volume:	872 vehicle	s		He	eavy Truc	:ks (3+ A	xles):	15		
Vel	hicle Speed:	40 mph		V	ehicle	Mix					
Near/Far Lar	ne Distance:	36 feet			Veł	nicleType		Day	Evening	Night	Daily
Site Data						A	lutos:	77.5%	12.9%	9.6%	86.07%
Bar	rier Heiaht:	0.0 feet			M	ledium Tr	ucks:	84.8%	4.9%	10.3%	2.85%
Barrier Type (0-W	all, 1-Berm):	0.0				Heavy Tr	ucks:	86.5%	2.7%	10.8%	11.07%
Centerline Dis	at. to Barrier:	100.0 feet		N	oise S	ource El	evations	s (in fe	et)		
Centerline Dist. t	to Observer:	100.0 feet				Autos	s: 0.0	000			
Barrier Distance t	to Observer:	0.0 feet			Mediu	m Trucks	s: 2.2	97			
Observer Height (/	Above Pad):	5.0 feet			Hea	vy Trucks	s: 8.0	004	Grade Adj	ustmen	t: 0.0
Pa	d Elevation:	0.0 feet			ono Ec	wheelent	Distant	o (in f	a a 41		
Roa	d Elevation:	0.0 feet		Li	ane Eq	uivalent	Distanc		eet)		
F	Road Grade:	0.0%			Madiu	Autos Trucké	5: 98.4	194			
	Right View:	-90.0 degre 90.0 degre	es es		Hea	vy Trucks	s. 98.4 s: 98.4	104 113			
	-	-				-					
VehicleType	REMEI	s Traffic Flow	Dist	tanca	Finite	Road	Freen		Parriar Atte	n Ro	rm Atton
Autos	66.51	-2 57	Dist	-4.52	1 111100	-1.20	110311	4 77	0.0	00	0.000
Medium Trucks:	77.72	-17.37		-4.51		-1.20		4.88	0.0	00	0.000
Heavy Trucks:	82.99	-11.48		-4.51		-1.20		-5.16	0.0	00	0.000
Unmitigated Noise	Levels (with	out Topo and	barrie	r attenu	ation)						
VehicleType	Leq Peak Ho	ur Leq Day	/	Leq Eve	ening	Leq	Night		Ldn	C	NEL
Autos:	58	.2	56.3		54.6		48.5		57.1		57.7
Medium Trucks:	54	.6	53.1		46.8		45.2		53.7		53.9
Heavy Trucks:	65	.8	64.4		55.3		56.6		64.9		65.1
Vehicle Noise:	66	5.8	65.3		58.3		57.5		65.9		66.1
Centerline Distance	e to Noise C	ontour (in feet)								
			1.1	70 dE	3A	65 0	aba	6	U dBA	55	dBA
		0	Lan:	53		11	14		247	-	531
		Ci	NEL:	55		11	18		254	:	¥8

	FH\	WA-RD-77-108	HIGH	WAY NO	OISE PI	REDICTIO	N MOD	EL				
Scenario: Road Name: Road Segment:	Year 2035 Oleander A w/o Harvill	With Project w. Av.			Project Name: Knox Business Park Job Number: 9349							
SITE SI	PECIFIC IN	IPUT DATA				NO	ISE M	ODEL	INPUTS	3		
Highway Data				s	Site Con	ditions (H	lard = 1	0, Soft	= 15)			
Average Daily Tr	affic (Adt):	8,715 vehicl	es				A	utos:	15			
Peak Hour Pe	ercentage:	10%			Me	dium Truc	ks (2 Ax	des):	15			
Peak Hou	ur Volume:	872 vehicle	s		He	avy Truck	s (3+ Ax	des):	15			
Vehi	cle Speed:	40 mph		V	ohicle	Mix						
Near/Far Lane	Distance:	36 feet		-	Veh	icleType		av F	venina	Niaht	Daily	
Site Data					1011	Au	tos: 7	7.5%	12.9%	9.6%	6 86.07%	
Parri	or Hoight:	0.0 foot			M	edium Tru	cks: 8	4.8%	4.9%	10.39	6 2.85%	
Barrier Type (0-Wal	I. 1-Berm):	0.0			1	Heavy Tru	cks: 8	6.5%	2.7%	10.8%	6 11.07%	
Centerline Dist.	to Barrier:	100.0 feet			laina Cr	uree Elev	ations	lin foot				
Centerline Dist. to	Observer:	100.0 feet		N	ioise so	Autor	auons	(III leet	/			
Barrier Distance to	Observer:	0.0 feet				Autos:	0.00)U 7				
Observer Height (Al	bove Pad):	5.0 feet			Mediu	m Trucks:	2.28		rado Adi	ustmor	nt: 0.0	
Pad	Elevation:	0.0 feet			neav	y mucks.	0.00	J4 01	auc Auji	usunor	<i>n</i> . 0.0	
Road	Elevation:	0.0 feet		L	ane Eq	uivalent L	Distance	e (in fee	et)			
Ro	ad Grade:	0.0%				Autos:	98.49	94				
	Left View:	-90.0 degre	es		Mediu	m Trucks:	98.40	04				
F	Right View:	90.0 degre	es		Heav	y Trucks:	98.41	13				
EHWA Noise Model	Calculation	16										
VehicleType	REMEI	Traffic Flow	Dist	ance	Finite	Road	Fresne	I Ba	arrier Atte	en Be	erm Atten	
Autos:	66.51	-2.57		-4.52		-1.20	-4	4.77	0.0	00	0.000	
Medium Trucks:	77.72	-17.37		-4.51		-1.20	-4	4.88	0.0	00	0.000	
Heavy Trucks:	82.99	-11.48		-4.51		-1.20	-8	5.16	0.0	00	0.000	
Unmitigated Noise I	evels (with	out Topo and	barrie	r atteni	uation)							
VehicleType L	eq Peak Ho	ur Leq Day	/	Leg Ev	ening	Leq N	ight	L	dn	(ONEL	
Autos:	, 58	3.2	56.3		54.6	,	48.5		57.1		57.7	
Medium Trucks:	54	.6	53.1		46.8		45.2		53.7		53.9	
Heavy Trucks:	65	5.8	64.4		55.3		56.6		64.9)	65.1	
Vehicle Noise:	66	6.8	65.3		58.3		57.5		65.9	1	66.1	
Centerline Distance	to Noise C	ontour (in feel)									
L				70 d	BA	65 dE	BA	60 (dBA	5	5 dBA	
			Ldn:	53	3	114		24	47		531	
		C	NEL:	55	5	118		25	54		548	

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APPENDIX 9.1:

REFERENCE NOISE SOURCE PHOTOS



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Reference Measurement: Motivational Fulfillment 6810 Bickmore Avenue, Chino



Motivational Fulfillment_01

Motivational Fulfillment_02



Motivational Fulfillment_03

Source_1-1



Source_1-2

Source_1-3

Reference Measurement: Motivational Fulfillment 6810 Bickmore Avenue, Chino



Source_1-4

Source_2-1



Source_2-2

Source_2-3



Source_2-4

Source_2-5

Reference Measurement: Motivational Fulfillment 6810 Bickmore Avenue, Chino



Source_2-6

Source_2-7



Source_2-8

Source_2-9

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APPENDIX 9.2:

STATIONARY-SOURCE NOISE CALCULATIONS

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Observer Location: R1

Source: Unloading/Docking Activity Condition: n/a

Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	2,598.0 feet
Noise Distance to Barrier:	2,598.0 feet
Barrier Distance to Observer:	0.0 feet

Observer Elevation: 1,705.0 feet Noise Source Elevation: 1,625.0 feet Barrier Elevation: 1,705.0 feet Barrier Height:0.0 feetNoise Source Height:8.0 feetObserver Height:5.0 feet

Barrier Type (0-Wall, 1-Berm): 0 Drop Off Coefficient: 20.0

> 20 = 6 dBA per doubling of distance 15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS											
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax				
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0				
Distance Attenuation	2,598.0	-38.8	-38.8	-38.8	-38.8	-38.8	-38.8				
Shielding (Barrier Attenuation)	2,598.0	0.0	0.0	0.0	0.0	0.0	0.0				
Raw (Distance + Barrier)		28.4	25.4	28.4	33.0	36.8	41.2				
60 Minute Hourly Adjustmer	nt	28.4	25.4	28.4	33.0	36.8	41.2				

STATIONARY SOURCE NOISE PREDICTION MODEL 1/24/										
Observer Location: R2 Source: Unloading/Docking Activity Condition: n/a	Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe									
NOISE M	IODEL INPUTS									
Noise Distance to Observer 1,685.0 feet	Barrier Height:	0.0 feet								
Noise Distance to Barrier: 1,685.0 feet	Noise Source Height:	8.0 feet								
Barrier Distance to Observer: 0.0 feet	Observer Height:	5.0 feet								
Observer Elevation: 1,696.0 feet Noise Source Elevation: 1,625.0 feet	Barrier Type (0-Wall, 1-Berm): Drop Off Coefficient:	0 20.0								
Barrier Elevation: 1,696.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling	of distance of distance								

NOISE MODEL PROJECTIONS L2 Noise Level Distance (feet) Leq L50 L25 L8 Lmax Reference (Sample) 30.0 67.2 64.2 67.2 71.8 75.6 80.0 -35.0 **Distance Attenuation** 1,685.0 -35.0 -35.0 -35.0 -35.0 -35.0 Shielding (Barrier Attenuation) 1,685.0 0.0 0.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 32.2 29.2 32.2 36.8 40.6 45.0 **Minute Hourly Adjustment** 60 32.2 29.2 32.2 36.8 40.6 45.0

Observer Location: R3

Source: Unloading/Docking Activity Condition: n/a

Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	1,577.0 fe	eet
Noise Distance to Barrier:	1,577.0 f	eet
Barrier Distance to Observer:	0.0 fe	eet

Observer Elevation: 1,730.0 feet Noise Source Elevation: 1,625.0 feet Barrier Elevation: 1,730.0 feet Barrier Height:0.0 feetNoise Source Height:8.0 feetObserver Height:5.0 feet

Barrier Type (0-Wall, 1-Berm): 0 Drop Off Coefficient: 20.0

> 20 = 6 dBA per doubling of distance15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS											
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax				
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0				
Distance Attenuation	1,577.0	-34.4	-34.4	-34.4	-34.4	-34.4	-34.4				
Shielding (Barrier Attenuation)	1,577.0	0.0	0.0	0.0	0.0	0.0	0.0				
Raw (Distance + Barrier)		32.8	29.8	32.8	37.4	41.2	45.6				
60 Minute Hourly Adjustmer	nt	32.8	29.8	32.8	37.4	41.2	45.6				

STATIONARY SOUR	CE NOISE PREDICTION MODEL	1/24/2017
Observer Location: R4 Source: Unloading/Docking Activity Condition: n/a	Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe	
NOISE	MODEL INPUTS	
Noise Distance to Observer 1,164.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier: 1,164.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer: 0.0 feet	Observer Height:	5.0 feet
Observer Elevation: 1,707.0 feet Noise Source Elevation: 1,625.0 feet	Barrier Type (0-Wall, 1-Berm): Drop Off Coefficient:	0 20.0
Barrier Elevation: 1,650.0 feet	20 = 6 dBA per doubling c 15 = 4.5 dBA per doubling	of distance of distance

	NOIS	E MODEL I	PROJECTI	ONS			
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0
Distance Attenuation	1,164.0	-31.8	-31.8	-31.8	-31.8	-31.8	-31.8
Shielding (Barrier Attenuation)	1,164.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		35.4	32.4	35.4	40.0	43.8	48.2
60 Minute Hourly Adjustmer	nt	35.4	32.4	35.4	40.0	43.8	48.2

Observer Location: R5

Barrier Distance to Observer:

Source: Unloading/Docking Activity Condition: n/a

0.0 feet

Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe

NOISE MODEL INPUTS Noise Distance to Observer 881.0 feet Barrier Height: 0.0 feet Noise Distance to Barrier: 881.0 feet Noise Source Height: 8.0 feet

Observer Elevation: 1,635.0 feet Noise Source Elevation: 1,615.0 feet Barrier Elevation: 1,635.0 feet Noise Source Height:8.0 feetObserver Height:5.0 feet

Barrier Type (0-Wall, 1-Berm): 0 Drop Off Coefficient: 20.0

> 20 = 6 dBA per doubling of distance 15 = 4.5 dBA per doubling of distance

	NOISE	MODEL P	ROJECTIC	DNS			
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0
Distance Attenuation	881.0	-29.4	-29.4	-29.4	-29.4	-29.4	-29.4
Shielding (Barrier Attenuation)	881.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		37.8	34.8	37.8	42.4	46.2	50.6
60 Minute Hourly Adjustmer	nt	37.8	34.8	37.8	42.4	46.2	50.6

STATIONARY SOURCE	NOISE PREDICTION MODEL	1/24/2017
Observer Location: R6 Source: Unloading/Docking Activity Condition: n/a	Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe	
NOISE MO	ODEL INPUTS	
Noise Distance to Observer 276.0 feet	Barrier Height:	8.0 feet
Noise Distance to Barrier: 81.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer: 195.0 feet	Observer Height:	5.0 feet
Observer Elevation: 1 608.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation: 1,580.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation: 1,600.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	of distance of distance

	NOISE	E MODEL F	PROJECTI	ONS			
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0
Distance Attenuation	276.0	-19.3	-19.3	-19.3	-19.3	-19.3	-19.3
Shielding (Barrier Attenuation)	81.0	-11.0	-11.0	-11.0	-11.0	-11.0	-11.0
Raw (Distance + Barrier)		36.9	33.9	36.9	41.5	45.3	49.7
60 Minute Hourly Adjustmer	nt	36.9	33.9	36.9	41.5	45.3	49.7

Observer Location: R7

Source: Unloading/Docking Activity Condition: n/a

Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe

NOISE MODEL INPUTSNoise Distance to Observer998.0 feetBarrier Height:0.0 feetNoise Distance to Barrier:102.0 feetNoise Source Height:8.0 feetBarrier Distance to Observer:896.0 feetObserver Height:5.0 feet

Observer Elevation: 1,560.0 feet Noise Source Elevation: 1,575.0 feet Barrier Elevation: 1,571.0 feet Barrier Type (0-Wall, 1-Berm): 0 Drop Off Coefficient: 20.0

> 20 = 6 dBA per doubling of distance15 = 4.5 dBA per doubling of distance

	NOIS	E MODEL I	PROJECTI	ONS			
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0
Distance Attenuation	998.0	-30.4	-30.4	-30.4	-30.4	-30.4	-30.4
Shielding (Barrier Attenuation)	102.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		36.8	33.8	36.8	41.4	45.2	49.6
60 Minute Hourly Adjustmer	nt	36.8	33.8	36.8	41.4	45.2	49.6

STATIONARY SOURCE	NOISE PREDICTION MODEL	1/24/2017
Observer Location: R8 Source: Unloading/Docking Activity Condition: n/a	Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe	
NOISE M	ODEL INPUTS	
Noise Distance to Observer 1,310.0 feet	Barrier Height:	0.0 feet
Noise Distance to Barrier: 1,310.0 feet	Noise Source Height:	8.0 feet
Barrier Distance to Observer: 0.0 feet	Observer Height:	5.0 feet
Observer Elevation: 1.540.0 feet	Barrier Type (0-Wall, 1-Berm):	0
Noise Source Elevation: 1,575.0 feet	Drop Off Coefficient:	20.0
Barrier Elevation: 1,540.0 feet	20 = 6 dBA per doubling o 15 = 4.5 dBA per doubling	of distance of distance

	NOISI	E MODEL F	PROJECTI	ONS			
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	30.0	67.2	64.2	67.2	71.8	75.6	80.0
Distance Attenuation	1,310.0	-32.8	-32.8	-32.8	-32.8	-32.8	-32.8
Shielding (Barrier Attenuation)	1,310.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		34.4	31.4	34.4	39.0	42.8	47.2
60 Minute Hourly Adjustmer	nt	34.4	31.4	34.4	39.0	42.8	47.2

APPENDIX 9.3:

CUMULATIVE STATIONARY-SOURCE NOISE CALCULATIONS



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Source: P13 Condition: Cumulative			i indicit i	Value, iniun	DUSINESS PAIK		
Condition: Cumulative			UN QOL	imber: 9349			
	e Developments		Ar	nalyst: A. Wo	olfe		
	ION	ISE MODE	- INPUTS				
Noise Distance to Observer	7,590.0 feet			Ø	arrier Height:	0.0	feet
Noise Distance to Barrier: 7	7,590.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
ī			Bar	rier Tvne (0-	Wall. 1-Berm):	C	
Ubserver Elevation: Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doub	ng of distance ling of distar	e e
	NOISE	MODEL PI	SOJECTIO	SN			
Noise Level L	Distance (feet)	req	L50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	7,590.0	-48.1	-48.1	-48.1	-48.1	-48.1	4
Shielding (Barrier Attenuation)	7,590.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		19.1	-48.1	-48.1	-48.1	-48.1	4
60 Minute Hourly Adjustment		19.1	-48.1	-48.1	-48.1	-48.1	4
Observer Location: R1 Source: RC10			Project I Job Nu	Vame: Knox mber: 9349	Business Park		
Condition: Cumulative	e Developments		Ar	nalyst: A. Wo	olfe		
	ION	ISE MODEI	- INPUTS				
Noise Distance to Observer	2,687.0 feet			Ø	arrier Height:	0.0	feet
Noise Distance to Barrier: 2	2,687.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob	server Height:	5.0	feet
Observer Flevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doub	ng of distance ling of distar	ee
	NOISE	MODEL PI	SOJECTIO	SN			
Noise Level C	Distance (feet)	Leq	L50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	12,687.0	-52.5	-52.5	-52.5	-52.5	-52.5	ίĢ
Shielding (Barrier Attenuation)	12,687.0	0.0	0.0	0.0	0.0	0.0	Ū
Raw (Distance + Barrier)		14.7	-52.5	-52.5	-52.5	-52.5	Ŷ
60 Minute Hourly Adjustment		14.7	-52.5	-52.5	-52.5	-52.5	ίγ

Source: RC6 Condition: Cumulati			Project	Vame: Knox	Business Par	Ł	
Condition: Cumulativ	-		Job Nr	mber: 9349			
	ve Developments		A	naryst: A. Wi	olfe		
	NO	ISE MODE	L INPUTS				
Noise Distance to Observer	9,651.0 feet			-	arrier Height	0.0	feet
Noise Distance to Barrier:	9,651.0 feet			Noise :	Source Heigh	ť: 8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Heigh	ť: 5.0	feet
Observer Elevetion:	0.0 foot		Bar	rier Type (0-	Wall, 1-Berm	.(
Usion Serven Flaration.	0.0 1661			Drop	Off Coefficien	t: 20.0	
Noise Source Elevation:	0.0 Teet			00		and distant	
Barrier Elevation:	0.0 feet			20 = 15 =	: 6 dBA per aoub : 4.5 dBA per dou	Ing of distanc	9
	NOISE	MODEL P	ROJECTIC	SNO			
Noise Level	Distance (feet)	ped	L50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	9,651.0	-50.1	-50.1	-50.1	-50.1	-50.1	-20
Shielding (Barrier Attenuation)	9,651.0	0.0	0.0	0.0	0.0	0.0	O
Raw (Distance + Barrier)		17.1	-50.1	-50.1	-50.1	-50.1	-50.
60 Minute Hourly Adjustment		17.4	101	50.4	50.4	50.4	2
Observer Location: R1			Project	Vame: Knox	Business Pa	ž	
Source: BC3			in doi	mhar: 0340			
Condition: Cumulati	ve Developments		A	nalyst: A. Wi	olfe		
	ON	ISE MODE	L INPUTS				
Noise Distance to Observer	2,800.0 feet			8	arrier Height	:: 0:0	feet
Noise Distance to Barrier:	2,800.0 feet			Noise 3	Source Heigh	ť: 8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Heigh	ť: 5.0	feet
Ohsenier Elevetion:	00 feet		Bar	rier Type (0-	Wall, 1-Berm	.(
Noise Source Flevation:	0.0 feet			Drop	Off Coefficien	ť: 20.0	
Barrier Elevation:	0.0 feet			20 =	6 dBA per doub	ling of distanc	e
				= 61	: 4.5 abA per aon	ibling of distar	JCe
	NOISE	MODEL P	ROJECTIC	NS			
Noise Level	Distance (feet)	req	T50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	o.
Distance Attenuation	2,800.0	-39.4	-39.4	-39.4	-39.4	-39.4	-39.
Shielding (Barrier Attenuation)	2,800.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		27.8	-39.4	-39.4	-39.4	-39.4	-39.
60 Minute Hourly Adjustment	_	27.8	-39.4	-39.4	-39.4	-30.4	-30

Condition: Cumulative					DUSINESS PAIK		
			nn aor	mber: 9349			
	Developments		AI	nalyst: A. Wo	olte		
	ION	ISE MODEI	- INPUTS				
Noise Distance to Observer 3	i,514.0 feet			B	arrier Height:	0.0	feet
Noise Distance to Barrier: 3	,514.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Obconsion Floringion			Bar	rier Type (0-	-Wall, 1-Berm):	0	
Observer Elevation: Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doubling = 4.5 dBA per doubli	g of distano ing of distar	e e
	NOISE	MODEL PI	SOJECTIO	SN			
Noise Level D.	istance (feet)	req	L50	L25	87	L2	Lma.
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	13,514.0	-53.1	-53.1	-53.1	-53.1	-53.1	٩ŕ
Shielding (Barrier Attenuation)	13,514.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		14.1	-53.1	-53.1	-53.1	-53.1	Ϋ́
60 Minute Hourly Adjustment		14.1	-53.1	-53.1	-53.1	-53.1	Ŷ
Observer Location: R1 Source: RC15			Project I Job Nu	Vame: Knox mber: 9349	Business Park		
Condition: Cumulative	Developments		A	niluer. 3349 nalyst: A. Wo	olfe		
	ION	ISE MODEL	- INPUTS				
Noise Distance to Observer 9	1,714.0 feet			B	arrier Height:	0.0	feet
Noise Distance to Barrier: 9	1,714.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Flevation:	0.0 feet		Bar	rier Type (0-	·Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	- 6 dBA per doubling - 4.5 dBA per doubli	g of distanc ing of distar	e 90
	NOISE	MODEL PI	SOJECTIO	SN			
Noise Level D.	istance (feet)	req	L50	L25	87	<i>L2</i>	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	9,714.0	-50.2	-50.2	-50.2	-50.2	-50.2	Ŷ
Shielding (Barrier Attenuation)	9,714.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		17.0	-50.2	-50.2	-50.2	-50.2	Ŷ
60 Minute Hourly Adiustment		17.0	-50.2	-50.2	-50.2	-50.2	Ÿ

ODSELVEL LUCATION: NI			Project N	lame: Knox	Business Par	×	
Source: P20 Condition: Cumulati	ve Developments		Job Nu An	mber: 9349 alyst: A. Wc	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer	11,100.0 feet			Ø	arrier Height.	0.0	feet
Noise Distance to Barrier:	11,100.0 feet			Noise S	source Height	: 8.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height	: 5.0	feet
Ohservar Flavation:	0 0 faat		Barı	ier Type (0-	Wall, 1-Berm)	0	
Noise Source Flevation:	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dou	ng of distanc bling of distar	e JCe
	NOISE			SN			
Noise Level	Distance (feet)	Leq	L50	L25	87	12	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	11,100.0	-51.4	-51.4	-51.4	-51.4	-51.4	-5-1-
Shielding (Barrier Attenuation)	11,100.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		15.8	-51.4	-51.4	-51.4	-51.4	- 2
60 Minute Hourly Adjustmen		15.8	-51.4	-51.4	-51.4	-51.4	5
Observer Location: R1			Project N	lame: Knox	Business Par	×	
Source: RC12			Job Nu	mber: 9349			
Condition: Cumulati	ve Developments		An	alyst: A. Wo	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer	9,054.0 feet			Q	arrier Height.	. 0.0	feet
Noise Distance to Barrier:	9,054.0 feet			Noise S	source Height	: 5.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height	: 5.0	feet
Observer Elevation:	0.0 feet		Barı	ier Type (0-	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient	: 15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dou	ng of distano bling of distar	e 10e
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level	Distance (feet)	Гeq	T50	L25	78	<i>L2</i>	Lmax
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	Ó
Distance Attenuation	9,054.0	-48.9	-48.9	-48.9	-48.9	-48.9	-48
Shielding (Barrier Attenuation)	9,054.0	0.0	0.0	0.0	0.0	0.0	Ő
Raw (Distance + Barrier)		11.2	-48.9	-48.9	-48.9	-48.9	48

Condition: Cumulativ				vanie. NIUX	DUSITIESS Park		
	/e Developments		JOD NU Ar	imber: 9349 nalyst: A. Wo	olfe		
	ION	SE MODE	L INPUTS				
Noise Distance to Observer	1,812.0 feet				arrier Height:	0.0	feet
Noise Distance to Barrier: Barrier Distance to Observer:	1,812.0 feet 0.0 feet			, aoinn GD	source Height: server Height:	8.U 5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of dista	e nce
	NOISE	MODEL PI	ROJECTIO	SNO			
Noise Level	Distance (feet)	req	L50	125	18	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	1,812.0	-35.6	-35.6	-35.6	-35.6	-35.6	Ŷ
Shielding (Barrier Attenuation)	1,812.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		31.6	-35.6	-35.6	-35.6	-35.6	ę
60 Minute Hourly Adjustment		31.6	-35.6	-35.6	-35.6	-35.6	ņ
Observer Location: R2 Source: RC6 Condition: Cumulati			Project I Job Nu	Vame: Knox Imber: 9349	Business Park		
Conation: Cumulati	ve Developments		A	raiyst: A. wo	olre		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	0,814.0 feet			Q	arrier Height:	0.0	feet
Noise Distance to Barrier:	0,814.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of dista	ie nce
	NOISE	MODEL PI	ROJECTIO	SNO			
Noise Level	Distance (feet)	req	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	10,814.0	-51.1	-51.1	-51.1	-51.1	-51.1	ų
Shielding (Barrier Attenuation)	10,814.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		16.1	-51.1	-51.1	-51.1	-51.1	ų

C110			Project I	Vame: Knox	Business Park		
Source: P4/			Job Nu	umber: 9349			
Condition: Cumulati	ve Developments		Ar	nalyst: A. Wo	olfe		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	7,461.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	7,461.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of distar	80
	NOISE	MODEL PI	ROJECTIC	SNG			
Noise Level	Distance (feet)	Leq	T50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	7,461.0	-47.9	-47.9	-47.9	-47.9	-47.9	-47
Shielding (Barrier Attenuation)	7,461.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		19.3	-47.9	-47.9	-47.9	-47.9	-47
60 Minute Hourly Adjustmen	_	19.3	-47.9	-47.9	-47.9	-47.9	-47
Observer Location: R1			Project I	Vame: Knox	Business Park		
Source: RC1			Job Nu	umber: 9349			
Condition: Cumulati	ve Developments		Aı	nalyst: A. Wo	olfe		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	169.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	169.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of distar	e 90
	NOISE	MODEL PI	ROJECTIC	SNG			
Noise Level	Distance (feet)	Leq	T50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	169.0	-15.0	-15.0	-15.0	-15.0	-15.0	-15
Shielding (Barrier Attenuation)	169.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		52.2	-15.0	-15.0	-15.0	-15.0	-15

Source: RC10 Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:			i voofori i		A DUSILIESS F ALK		
Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:			JOD NL	umber: 9349	_		
Noise Distance to Observer Noise Distance to Barrier:	e Developments		A	nalyst: A. W	olfe		
Noise Distance to Observer Noise Distance to Barrier:	ION	SE MODE	L INPUTS				
Noise Distance to Barrier:	1,406.0 feet			Ш	3arrier Height:	0.0	feet
	1,406.0 feet			Noise	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			10	bserver Height:	5.0	feet
Ohsenver Flavation.	00 feet		Bar	rier Type (0	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublin = 4.5 dBA per doubl	ig of distanc ling of dista	e
	NOISE	MODEL P	ROJECTIC	SNO			
Noise Level	Distance (feet)	req	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	11,406.0	-51.6	-51.6	-51.6	-51.6	-51.6	Ŷ
Shielding (Barrier Attenuation)	11,406.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		15.6	-51.6	-51.6	-51.6	-51.6	Ŷ
60 Minute Hourly Adjustment		15.6	-51.6	-51.6	-51.6	-51.6	Ÿ
Observer Location: R2 Source: P20			Project I Job Nu	<i>Name:</i> Knox <i>Imber:</i> 9349	K Business Park		
Condition: Cumulativ	e Developments		A	nalyst: A. W	olfe		
	ION	SE MODE	L INPUTS				
Noise Distance to Observer	9,911.0 feet			-	3arrier Height:	0.0	feet
Noise Distance to Barrier:	9,911.0 feet			Noise	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			10	bserver Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20= 15=	= 6 dBA per doublin = 4.5 dBA per doubl	g of distanc ling of dista	e Jce
	NOISE	MODEL P	ROJECTIC	SNO			
Noise Level	Distance (feet)	Leq	T50	L25	87	L2	Lm
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	9,911.0	-50.4	-50.4	-50.4	-50.4	-50.4	'
Shielding (Barrier Attenuation)	9,911.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		16.8	-50.4	-50.4	-50.4	-50.4	
Ministry Andrew Control of the Contr		0.07					

Source: RC2 Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:			Project P	Vame: Knox	Business Par	×	
Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:			nN dol	mber: 9349		:	
Noise Distance to Observer Noise Distance to Barrier:	e Developments		Ar	nalyst: A. Wc	olfe		
Noise Distance to Observer	ION	ISE MODEI	L INPUTS				
Noise Distance to Barrier:	2,110.0 feet			ä	arrier Height.		feet
	2,110.0 feet			Noise S	source Height		feet
Barrier Distance to Observer:	0.0 feet			Ob.	server Height.	: 5.0	feet
Ohserver Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm)	0	
Noise Source Flevation	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dou	ing of distanc bling of distar	90
	NOISE	MODEL PI	SOLECTIO	SN			
Noise Level	Distance (feet)	bəŢ	L50	L25	<i>L8</i>	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	2,110.0	-36.9	-36.9	-36.9	-36.9	-36.9	-36.9
Shielding (Barrier Attenuation)	2,110.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.3	-36.9	-36.9	-36.9	-36.9	-36.9
60 Minute Hourly Adjustment		30.3	-36.9	-36.9	-36.9	-36.9	-36.9
Observer Location: R2			Project I	Vame: Knox	Business Par	×	
Source: P13			Job Nu	mber: 9349			
Condition: Cumulativ	e Developments		Ar	nalyst: A. Wo	olfe		
	ION	ISE MODEI	L INPUTS				
Noise Distance to Observer	7,023.0 feet			B	arrier Height.	: 0.0	feet
Noise Distance to Barrier:	7,023.0 feet			Noise S	source Height		feet
Barrier Distance to Observer:	0.0 feet			Ob.	server Height	: 5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient	: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dou	ing of distanc bling of distar	6
	NOISE	MODEL PI	SOJECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	7,023.0	-47.4	-47.4	-47.4	-47.4	-47.4	-47.4
Shielding (Barrier Attenuation)	7,023.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		19.8	-47.4	-47.4	-47.4	-47.4	-47.4
60 Minute Hourly Adjustment		19.8	-47.4	-47.4	-47.4	-47.4	-47.4

Condition: Cumulativ			IN YOL	mher: 9349			
	e Developments		Ar	nalyst: A. Wi	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer	8,634.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	8,634.0 feet			Noise 3	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Flevation	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublin = 4.5 dBA per doub	ig of distanc ling of dista	e QG
	NOISE	MODEL PR	SOJECTIO	SNO			
Noise Level	Distance (feet)	Leq	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	8,634.0	-49.2	-49.2	-49.2	-49.2	-49.2	í
Shielding (Barrier Attenuation)	8,634.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		18.0	-49.2	-49.2	-49.2	-49.2	i
60 Minute Hourly Adjustment		18.0	-49.2	-49.2	-49.2	-49.2	7
Observer Location: R2 Source: P47			Project I Job Nu	Vame: Knox mber: 9349	Business Park		
Condition: Cumulativ	e Developments		Ar	nalyst: A. Wi	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer	5,684.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	5,684.0 feet			Noise 3	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublin = 4.5 dBA per doub	g of distanc ling of dista	e e
	NOISE	MODEL PR	ROJECTIO	SNO			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lm
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	6,684.0	-47.0	-47.0	-47.0	-47.0	-47.0	í
Shielding (Barrier Attenuation)	6,684.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		20.2	-47.0	-47.0	-47.0	-47.0	7
60 Minute Hourly Adjustment		20.2	-47.0	-47.0	-47.0	-47.0	4

Source: RC12			Project N	<i>lame:</i> Knox	Business Park		
Condition: Cumulativ	/e Developments		Job Nu An	mber: 9349 alyst: A. Wo	lfe		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	7,792.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	7,792.0 feet			Noise S	ource Height:	5.0	feet
Barrier Distance to Observer:	0.0 feet			iq0	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Barı	ier Type (0-1	Vall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublir 4.5 dBA per doub	g of distanc ing of distar	e 10e
	NOISE	MODEL PF	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lma
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	
Distance Attenuation	7,792.0	-47.9	-47.9	-47.9	-47.9	-47.9	7
Shielding (Barrier Attenuation)	7,792.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		12.2	-47.9	-47.9	-47.9	-47.9	7
60 Minute Hourly Adjustment		12.2	-47.9	-47.9	-47.9	-47.9	٢
Observer Location: R2			Project N	lame: Knox	- Business Park	,	
Source: RC13			Inh Mil	mher 9349			
Condition: Cumulativ	e Developments		An	alyst: A. Wo	lfe		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	2,230.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	2.230.0 feet			Noise S	ource Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob:	server Height:	5.0	feet
Ohseniar Elevetion:	0.0 feet		Barı	ier Type (0-1	Vall, 1-Berm):	0	
Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublir 4.5 dBA per doub	g of distanc ing of dista	e 10e
	NOISE	MODEL PR	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	12,230.0	-52.2	-52.2	-52.2	-52.2	-52.2	Ŷ
Shielding (Barrier Attenuation)	12,230.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		15.0	-52.2	-52.2	-52.2	-52.2	Ŷ
60 Minute Hourly Adjustment		15.0	-52.2	-522	57.7	52.7	٦

Source: RC2 Job Number: Analyst: Condition: Cumulative Developments Job Number: Analyst: Noise Distance to Observer: Job Number: Source Noise Distance to Observer: 0.0 feet Noise Distance to Barrier: 2,308.0 feet Noise Distance to Observer: 0.0 feet Barrier Distance to Barrier: 2,308.0 feet Noise Distance to Observer: 0.0 feet Barrier Distance to Barrier: 2,308.0 feet Noise Distance to Barrier: 0.0 feet Lo L Noise Leval Distance (feet) Leq L50 L25 Noise Leval 0.0 feet 2,308.0 o.37.7 o.37 37.7 o.3 Shelding (Barrier Attenuation 2,308.0 o.37.7 o.37.7 o.3 37.7 o.3 Shelding (Barrier Attenuation 2,308.0 o.00 0.0 o.0 0.0 Raw (Distance + Barrier) 2,308.0 o.37.7 o.37.7 o.3 37.7 o.3 Shelding (Barrier Attenuation 2,308.0 o.00 0.0 0.0 Raw (Distance to Barrier Tyte Source: P13 Analyst: Source: P13 Condition: Cumulative Developments Analyst: Noise Distance to Observer: 0.0 feet Earrier Levation Noise Distance to Observer: 0.0 feet Earrier Distance to Observer: Noise Distance to Observer: Noise Distance to Observer: 0.0 feet Earrier Distance to Obse	349		
Condition: Cumulative Developments Analyst: NOISE MODEL INDUTS Noise Distance to Observer 2.308.0 feet M Noise Distance to Observer 0.0 feet M Noise Distance to Observer 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Lo Noise Source Elevation: 2,308.0 37.7 -3 Sintelding (Barier Attenuation) 2,308.0 37.7 -3 Sintelding (Barier Attenuation) 2,308.0 37.7 -3 Sintelding (Barier Attenuation) 2,308.0 37.7 -3 Raw (Distance Hearter) 29.5 37.7 -3 Source: P13 Source: P13 Noise Distance to Observer Noise Distance to Barrier: 7,158.0 Noise Distance to Observer 0.0 feet Barrier Typet Namer Noise Distance to Observer 0.0 feet Lo Rarrier Distance to Observer			
NOISE MODEL INDUTS Noise Distance to Observer 2,308.0 feet Noise Distance to Barrier. 2,308.0 feet Noise Distance to Barrier. 2,308.0 feet Noise Distance to Observer. 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet L50 L25 Noise Level Distance (feet) Leq L50 L37 -3 Noise Level Distance (feet) Leq L50 L37 -3 Reference (Sample) 2,308.0 -37.7 -3 -37.7 -3 Shielding (Barrieh Attenuation) 2,308.0 -37.7 -3 -37.7 -3 Reference (Sample) 2,308.0 -37.7 -3 -37.7 -3 Raw (Distance Heurity Adjustment 2,308.0 -37.7 -3 -3 -37.7 -3 Raw (Distance Heurity Contents 2,308.0 -37.7 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3 -3	A. Wolfe		
Noise Distance to Observer 2,308.0 feet Barrier 1/y Noise Distance to Barrier: 2,308.0 feet Barrier 1/y Noise Distance to Daserver: 0.0 feet Barrier 1/y Chose Source Elevation: 0.0 feet Barrier 1/y Noise Source Elevation: 0.0 feet Barrier 1/y Noise Source Elevation: 0.0 feet Barrier 1/y Noise Source Elevation: 0.0 feet 1/25 Noise Level Distance (feet) Leq L50 Shielding (Barrier Attenuation) 2,308.0 -37.7 -37.7 Shielding (Barrier Attenuation) 2,308.0 0.0 0.0 0.0 Raw (Distance Heurity Adjustment 29.5 -37.7 -37.7 -37.7 -37.7 Station: Elevation: 2.31.0 29.5 -37.7 -37.7 -37.7 -37.7 Raw (Distance Heurity Adjustment 29.5 -37.7 <t< td=""><td></td><td></td><td></td></t<>			
Noise Distance to Barrier: 2,308.0 feet M Barrier Distance to Observer: 0.0 feet Barrier Typ Observer Elevation:: 0.0 feet Barrier Typ Noise Source Elevation:: 0.0 feet Barrier Typ Noise Source Elevation:: 0.0 feet Elevation: Noise Source Elevation:: 0.0 feet Elevation: Noise Source Elevation:: 0.0 feet Elevation: Noise Source Elevation: 2,308.0 -37.7 Stielding (Barrier Attenuation) 2,308.0 -37.7 Stielding (Barrier Attenuation) 2,308.0 -37.7 Statoce Attenuation 2,308.0 -37.7 Raw (Distance + Barrier) 2,308.0 -37.7 Statoce Attenuation 2,308.0 -37.7 Raw (Distance to Barrier) 29.5 -37.7 Observer Location: Raw (Distance to Barrier) Analyst: Noise Distance to Observer 7,158.0 feet Monse Distance to Barrier: 7,158.0 feet Noise Distance to Observer 0.0 feet Barrier Elevation: Noise Distance to Observer 0.0 feet Leof Noise Distance to Observer 0.0 feet Leof Noise Distance to Observer 0.0 feet Leof Noise Distance to Observer 0.0 fee	Barrier Height:	0.0 fe	ě
Barrier Distance to Observer: 0.0 feet Barrier Type Observer Elevation:: 0.0 feet Barrier Type Noise Source Elevation:: 0.0 feet Barrier Type Noise Source Elevation:: 0.0 feet Leq L50 Noise Level Distance (feet) Leq L50 125 Reference (Sample) 2,308.0 -37.7 -37.7 -37.7 Shielding (Barrier Attenuation) 2,308.0 -37.7 -37.7 -37.7 Shielding (Barrier Attenuation) 2,308.0 -37.7 -37.7 -37.7 Shielding (Barrier Attenuation) 2,308.0 -37.7 -37.7 -37.7 Stance Heartien) 2,308.0 -37.7 -37.7 -37.7 -37.7 Stance Attenuation 2,308.0 -0.0 0.0 0.0 -37.7 -37.7 Stance Heartien) 2,308.0 -37.7 -37.7 -37.7 -37.7 -37.7 Stance Control (Dettion) 29.5 -37.7 -37.7 -37.7 -37.7 Source: Project Name: 20.0 0.0 0.0 0.0 Source: Project Name: Noise Distance to Observer: 7,158.0 10 Noise Distance to Observer: 0.16 0.0 </td <td>bise Source Height:</td> <td>8.0 fe</td> <td>set</td>	bise Source Height:	8.0 fe	set
Observer Elevation: 0.0 feet Barrier Type Noise Source Elevation:: 0.0 feet Barrier Elevation: 0.0 feet Barrier Elevation:: 0.0 feet NOISE MODEL PROJECTIONS Noise Level Distance (feet) Leq L50 125 Noise Level Distance (feet) Leq L50 125 Shielding (Barrier Attenuation) 2,308.0 -37.7 -37.7 -3 Shielding (Barrier Attenuation) 2,308.0 -37.7 -3 -3 -3 Shielding (Barrier Attenuation) 2,308.0 0.0 0.0 0.0 -3 <td< td=""><td>Observer Height:</td><td>5.0 fe</td><td>et</td></td<>	Observer Height:	5.0 fe	et
Observer Leevation: 0.0 feet Distance Elevation: 0.0 feet Barrier Elevation: 0.0 feet Leq L50 L25 Noise Level Distance (feet) Leq L50 L25 Reference (Sample) 30.0 67.2 0.0 0.0 Shielding (Barrier Attenuation) 2,308.0 -37.7 -37.7 -3 Raw (Distance Henurity Adjustment 2,308.0 0.0 0.0 0.0 0.0 Raw (Distance to Durity Adjustment 29.5 -37.7 -3 -3 Observer Location: Rame: 7,158.0 Project Name: Analyst: Noise Distance to Observer 7,158.0 Eartier Elevation: 0.0 Eartier Levation: Leq LG Noise Distance to Observer 7,158.0 Eartier Elevation: 0.0 Eartier Levation: Leq LG Noise	e (0-Wall, 1-Berm):	0	
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NOISE MODEL PROJECTIONS Noise Level Distance (feet) Leq L50 L25 Reference (Sample) 30.0 67.2 0.0 -37.7 -3 Distance Attenuation 2,308.0 -37.7 -3	20 = 6 dBA per doublir 15 = 4.5 dBA per doub	ng of distance ling of distance	Ð
Noise Level Distance (feet) Leq L50 L25 Reference (Sample) 30.0 67.2 0.0 -3 Distance Attenuation 2,308.0 -37.7 -37.7 -3 Distance Attenuation 2,308.0 -37.7 -37.7 -3 Raw (Distance + Barrier) 2,308.0 0.0 0.0 0.0 Raw (Distance + Barrier) 2,308.0 9.5 -37.7 -3 Raw (Distance + Barrier) 2,308.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 2,308.0 29.5 -37.7 -3 -3 Raw (Distance + Barrier) 2,908.0 0.0 0.0 0.0 0.0 -3			
Reference (Sample) 30.0 67.2 0.0 Distance Attenuation 2,308.0 -37.7 -37.7 -3 Shielding (Barrier Attenuation) 2,308.0 -37.7 -3 -3 Shielding (Barrier Attenuation) 2,308.0 0.0 0.0 0.0 Raw (Distance + Barrier) 2,308.0 0.0 0.0 0.0 -3 Raw (Distance + Barrier) 2,308.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 29.5 -37.7 -3 Source: P13 Source: P13 Job Number: Job Number: Source: P13 Condition: Cumulative Developments Analyst: Analyst: Noise Distance to Observer 7,158.0 feet M M Noise Distance to Observer 0.0 feet L Noise Distance to Observer 0.0 feet Barrier Typ Noise Distance to Observer 0.0 feet Left L Noise Level 0.0 feet Barrier Levation: 0.0 feet L Noise Level Distance (feet)) Left L55 Reference (Sample) 30.0 67.2 0.0	87	L2	Lmax
Distance Attenuation 2,308,0 -37,7 -37,7 -3 Shielding (Barrier Attenuation) 2,308,0 0.0 0.0 0.0 Raw (Distance + Barrier) 2,9,5 -37,7 -3 60 Minute Hourly Adjustment 29,5 -37,7 -3 Analyst 29,5 -37,7 -3 60 Minute Hourly Adjustment 29,5 -37,7 -3 Analyst 29,5 -37,7 -3 Analyst: 29,5 -37,7 -3 Observer Location: R3 Job Number: Job Number: Source: P13 Job Number: Job Number: Noise Distance to Observer 7,158,0 feet M Noise Distance to Observer: 0.0 feet M Noise Distance to Observer: 0.0 feet Lof L Noise Source Elevation: 0.0 feet Barrier Levation: 0.0 feet Barrier Elevation: 0.0 feet Leof L L Noise Source Elevation: 0.0 feet Elevation: L L Distance (Reet) 1.66 L L <t< td=""><td>0.0</td><td>0.0</td><td></td></t<>	0.0	0.0	
Shielding (Barrier Attenuation) 2,308,0 0.0 0.0 Raw (Distance + Barrier) 29,5 -37.7 -3 60 Minute Hourly Adjustment 29,5 -37.7 -3 80 Minute Hourly Adjustment 29,5 -37.7 -3 71 29,5 -37.7 -3 80 Minute Hourly Adjustment 29,5 -37.7 -3 80 Minute Hourly Adjustment 29,5 -37.7 -3 80 Sources P13 Job Number: Job Number: 80 Sources P13 Job Number: Job Number: 80 Condition: Cumulative Developments Analyst: Analyst: Noise Distance to Observer 0.0 feet Moise Distance to Barrier: Noise Barrier Typ Noise Distance to Observer: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Levation: Noise Source Elevation: 0.0 feet Leq L55 Reference (Sample) 30.0 67.2 0.0	7.7 -37.7	-37.7	-37
Raw (Distance + Barrier) 29.5 -37.7 -3 60 Minute Hourly Adjustment 29.5 -37.7 -3 STATIONARY SOURCE NOISE PREDICTIONM STATIONARY SOURCE NOISE PREDICTIONM Observer Location: R3 Job Number: Source: P13 Job Number: Analyst: Job Number: Source: P13 Job Number: Noise Distance to Observer 7,158.0 feet Noise Distance to Barrier: 7,158.0 feet M Noise Distance (feet) Leq L Distance to Barrier Elevation: 0.0 feet Barrier Distance Noise Level Distance (feet) L L Noise Level Distance (feet) L L L Noise Level Distance (feet) L L L L <trtr> Noise Level Dist</trtr>	0.0 0.0	0.0	0
60 Minute Hourly Adjustment 29.5 -37.7 -3 STATIONARY SOURCE NOISE PREDICTION M STATIONARY SOURCE NOISE PREDICTION M STATIONARY SOURCE NOISE PREDICTION M Observer Location: R3 Source: P13 Source: P13 Source: P13 Noise Distance to Observer: 7,158.0 feet Noise Distance to Observer: 7,158.0 feet M Noise Distance to Barrier: 7,158.0 feet Barrier Typ Noise Distance to Distance to Barrier: 7,158.0 feet Barrier Typ Noise Distance to Distance to Barrier: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Levation: 0.0 feet Distance (Reet) Leq L50 Noise Level Distance (feet) L67 Distance (Sample) 30.0 67.2	7.7 -37.7	-37.7	-37
STATIONARY SOURCE NOISE PREDICTION M STATIONARY SOURCE NOISE PREDICTION M Choice: R3 Obb Number: Source: P13 Job Number: Source: P13 Job Number: Condition: Cumulative Developments Noise Distance to Observer 7,158.0 feet Noise Distance to Darrier: 7,158.0 feet NOISE MODEL INPUTS Noise Distance to Darrier: 7,158.0 feet N Noise Distance to Darrier: 7,158.0 feet N Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Level Distance (feet) Noise Attenuation 7,158.0	7.7 -37.7	-37.7	-37.
Source: P13 Job Number: Source: P13 Job Number: Condition: Lumulative Developments Analyst: Noise Distance to Observer 7,158.0 feet N Noise Distance to Barrier: 7,158.0 feet N Noise Distance to Barrier: 7,158.0 feet N Noise Distance to Barrier: 7,158.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Level 0.0 feet Leq L50 Noise Level Distance (feet) Leq L55 Reference (Sample) 30.0 67.2 0.0 Distance Attenuation 7,158.0 -47.6 -47.6	Knox Business Park		
Source: T-13 Dominant Condition: Cumulative Developments Analyst: Noise Distance to Observer 7,158.0 feet No Noise Distance to Observer: 0.0 feet No Barrier Distance to Observer: 0.0 feet Barrier Tyr Noise Source Elevation: 0.0 feet Barrier Tyr Noise Distance to Observer: 0.0 feet L Noise Source Elevation: 0.0 feet L Noise Level Distance (feet) Leq Noise Level Distance (feet) Leq Distance Kample 30.0 67.2 Obstance Attenuation 7,158.0 -47.6			
Noise Distance to Observer 7,158.0 feet NOISE MODEL INPUTS Noise Distance to Observer 7,158.0 feet N Noise Distance to Barrier 7,158.0 feet N Noise Distance to Observer 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet L Noise Source Elevation: 0.0 feet L Distance (feet) Leq L50 Noise Level Distance (feet) Leq Distance Attenuation 7,158.0 -47.6			
NOISE MODEL INPUTS Noise Distance to Observer 7,158.0 feet Noise Distance to Barrier 7,158.0 feet Noise Distance to Darrier 7,158.0 feet Barrier Distance to Observer 0.0 feet Barrier Distance 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Level Distance (feet) Leq Lo Distance Attenuation 7,158.0 A7.6 -47.6	A. WOIE		
Noise Distance to Observer 7,158.0 feet N Noise Distance to Barrier: 7,158.0 feet N Noise Distance to Barrier: 0.0 feet Barrier Typ Observer Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet Land Noise Source Elevation: 0.0 feet Land Barrier Elevation: 0.0 feet Land Distance (feet) Leq L50 Noise Level Distance (feet) Leq Instance (feet) 1.0 1.156 Noise Level 1.158.0 -47.6			
Noise Distance to Barrier: 7,158.0 feet N Barrier Distance to Observer: 0.0 feet Barrier Tyty Observer Elevation: 0.0 feet Barrier Tyty Noise Source Elevation: 0.0 feet Barrier Tyty Noise Source Elevation: 0.0 feet Left Reference (sample) 0.0 feet Left Noise Level Distance (feet) Left L25 Reference (Sample) 30.0 67.2 0.0 Distance Attenuation 7,158.0 -47.6 -47.6	Barrier Height:	0.0 fe	et
Barrier Distance to Observer: 0.0 feet Barrier Tyt Observer Elevation: 0.0 feet Barrier Tyt Noise Source Elevation: 0.0 feet Barrier Tyt Noise Source Elevation: 0.0 feet L Barrier Elevation: 0.0 feet L Reference 0.0 feet L Noise Level Distance (feet) Leq L55 Reference (Sample) 30.0 67.2 0.0 Distance Attenuation 7,158.0 -47.6 -47.6	oise Source Height:	8.0 fe	set
Observer Elevation: 0.0 feet Barrier Typ Noise Source Elevation: 0.0 feet L Barrier Elevation: 0.0 feet L Noise Level Distance (feet) Leq L50 Reference (Sample) 30.0 67.2 0.0 Distance Attenuation 7,158.0 -47.6 -47.6	Observer Height:	5.0 fe	set
Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Level Distance (feet) Leq L50 125 Reference (Sample) 30.0 67.2 0.0 125 Distance Attenuation 7,158.0 -47.6 -47.6 -4	e (0-Wall, 1-Berm):	0	
Noise Level Distance (feet) Leq L50 L25 Reference (Sample) 7,158.0 -47.6 -47.6 -47.6 -47.6	Prop Off Coefficient:	20.0	
NOISE MODEL PROJECTIONS Noise Level Distance (feet) Leq L50 L25 Reference (Sample) 30.0 67.2 0.0 -47.6 -47.6 -47.6	20 = 6 dBA per doublir 15 = 4.5 dBA per doub	ng of distance ling of distance	۵
Noise Level Distance (feet) Leq L50 L25 Reference (Sample) 30.0 67.2 0.0 -47.6 -47.6 -47.6			
Reference (Sample) 30.0 67.2 0.0 Distance Attenuation 7,158.0 -47.6 -4	87	L2 I	Lmax
Distance Attenuation 7,158.0 -47.6 -4	0.0 0.0	0.0	0
	7.6 -47.6	-47.6	-47
Shielding (Barrier Attenuation) 7,158.0 0.0 0.0	0.0 0.0	0.0	0
Raw (Distance + Barrier) 19.6 -47.6 -4	7.6 -47.6	-47.6	-47.
60 Minute Hourly Adjustment 19.6 -47.6 -4	7.6 -47.6	-47.6	-47

Source: RC22 Condition: Cumulati			r roject i	vame: Knox	Business Park		
	e Developments		Job Nu Ai	mber: 9349 nalyst: A. Wc	lfe		
	ON	ISE MODEL	- INPUTS				
Noise Distance to Observer	1,699.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	1,699.0 feet			Noise S	ource Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-I	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distance ing of distan	. 8
	NOISE	MODEL PF	ROJECTIC	SN			
Noise Level	Distance (feet)	bəŢ	L50	L25	18	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	1,699.0	-35.1	-35.1	-35.1	-35.1	-35.1	Ŷ
Shielding (Barrier Attenuation)	1,699.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		32.1	-35.1	-35.1	-35.1	-35.1	Ŷ
60 Minute Hourly Adjustment		32.1	-35.1	-35.1	-35.1	-35.1	Ŷ
Observer Location: R3			Project I	Jame: Knox	- Business Park		
Source: RC6			Job Nu	mber: 9349			
Condition: Cumulativ	e Developments		Aı	alyst: A. Wo	lfe		
	Ň	ISE MODEL	. INPUTS				
Noise Distance to Observer	1,562.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	1,562.0 feet			Noise S	ource Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-I	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distance ing of distan	<u>8</u>
	NOISE	MODEL PR	SOJECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	1
Distance Attenuation	11,562.0	-51.7	-51.7	-51.7	-51.7	-51.7	Ψ
Shielding (Barrier Attenuation)	11,562.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		15.5	-51.7	-51.7	-51.7	-51.7	47

 SUUICE. RUIZ			Inter Ali	wanne. Muux			
 Condition: Cumulativ	/e Developments		An An	mber: 9349 alyst: A. Wo	olfe		
	NOI	SE MODEI					
 Noise Distance to Observer	7,228.0 feet			ä	arrier Height:	0.0	eet
 Noise Distance to Barrier:	7,228.0 feet			Noise S	ource Height:	5.0	eet
 Barrier Distance to Observer:	0.0 feet			Obt	server Height:	5.0	eet
 Observer Elevention			Barı	rier Type (0-1	Wall, 1-Berm):	0	
 Observer Elevation. Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	15.0	
 Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distance ing of distan	e
	NOISE	MODEL PI	SOJECTIO	NS			
 Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	7,228.0	-47.4	-47.4	-47.4	-47.4	-47.4	-47.
Shielding (Barrier Attenuation)	7,228.0	0.0	0.0	0.0	0.0	0.0	0.0
 Raw (Distance + Barrier)		12.7	-47.4	-47.4	-47.4	-47.4	-47.
 60 Minute Hourly Adjustment		12.7	-47.4	-47.4	-47.4	-47.4	-47.
 Observer Location: R3 Source: RC13			Project N	Vame: Knox mher: 9349	Business Park		
 Source: RC13			nn dol	mber: 9349	160		
Condition: Cumulativ	/e Developments		An	ialyst: A. WC	lite		
	ION	SE MODEI	L INPUTS				
 Noise Distance to Observer	1,615.0 feet			ä	arrier Height:	0.0	eet
Noise Distance to Barrier:	1,615.0 feet			Noise S	ource Height:	8.0	eet
Barrier Distance to Observer:	0.0 feet			0 Př	server Height:	5.0	eet
Observer Elevation:	0.0 feet		Barı	rier Type (0-1	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
 Barrier Elevation:	0.0 feet			20 = 15 = ·	6 dBA per doublin 4.5 dBA per doubl	g of distance ing of distan	e
	NOISE	MODEL PI	SOJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	F8	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	11,615.0	-51.8	-51.8	-51.8	-51.8	-51.8	-51.8
Shielding (Barrier Attenuation)	11,615.0	0.0	0.0	0.0	0.0	0.0	0.0
 Raw (Distance + Barrier)		15.4	-51.8	-51.8	-51.8	-51.8	-51.8
 60 Minute Hourly Adjustment		15.4	-51.8	-51 8	-51 B	-51 8	-51.5

Condition: Cumulati			Inh Mu	mher: 0340			
	e Developments		A	nalyst: A. Wo	olfe		
	N	ISE MODEI	- INPUTS				
Noise Distance to Observer	0,756.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	0,756.0 feet			Noise S	source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doub	ig of distanc ling of dista	e
	NOISE	MODEL PI	SOJECTIO	SNO			
Noise Level	Distance (feet)	bəŢ	L50	L25	78	L2	Lme
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	10,756.0	-51.1	-51.1	-51.1	-51.1	-51.1	Ŷ
Shielding (Barrier Attenuation)	10,756.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		16.1	-51.1	-51.1	-51.1	-51.1	ŕ
60 Minute Hourly Adjustment		16.1	-51.1	-51.1	-51.1	-51.1	Ŷ
Observer Location: R3			Project I	Vame: Knox	- Business Park	,	
Source: P20			Job Nu	umber: 9349			
Condition: Cumulativ	e Developments		A	<i>halyst:</i> A. Wo	olfe		
	ON	ISE MODEI	- INPUTS				
Noise Distance to Observer	9,457.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	9,457.0 feet			Noise S	source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doub	ig of distanc ling of dista	е С
	NOISE	MODEL PI	SOJECTIO	SNO			
Noise Level	Distance (feet)	Leq	L50	L25	87	L2	Lme
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	9,457.0	-50.0	-50.0	-50.0	-50.0	-50.0	Ŷ
Shielding (Barrier Attenuation)	9,457.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		17.2	-50.0	-50.0	-50.0	-50.0	Ŷ

Source: RC1 Condition: Cumulati				VOLUCY INICY			
Condition: Cumulativ			Job Nu	mber: 9349			
	re Developments		An	ialyst: A. Wo	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer	132.0 feet			Ø	arrier Height:	0.0	feet
Noise Distance to Barrier:	132.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Flevation	0.0 feet		Bari	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin. 4.5 dBA per doubl	g of distanc ing of distar	e. Dce
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	18	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	132.0	-12.9	-12.9	-12.9	-12.9	-12.9	÷
Shielding (Barrier Attenuation)	132.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		54.3	-12.9	-12.9	-12.9	-12.9	÷
60 Minute Hourly Adjustment		54.3	-12.9	-12.9	-12.9	-12.9	-12
Observer Location: R3			Project N	Vame: Knox	Business Park		
Source: KU22 Condition: Cumulativ	re Developments		JOD NU Ar	mber: 9349 ialyst: A. Wo	olfe		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	2,260.0 feet			B	arrier Height:	0.0	feet
Noise Distance to Barrier:	2,260.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Ban	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of distar	e uce
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level	Distance (feet)	req	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	2,260.0	-37.5	-37.5	-37.5	-37.5	-37.5	μ̈́
Shielding (Barrier Attenuation)	2,260.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		29.7	-37.5	-37.5	-37.5	-37.5	Θ

Observer Location: R3			Project N	lame: Knox	Business Park		
Source: RC15			Job Nu	mber: 9349			
Condition: Cumulati	ve Developments		An	alyst: A. Wc	lfe		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	7,878.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	7,878.0 feet			Noise S	ource Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			'qO	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Barı	ier Type (0-I	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distance ling of distar	8
	NOISE	MODEL PF	ROJECTIO	NS			
Noise Level	Distance (feet)	bəŢ	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	7,878.0	-48.4	-48.4	-48.4	-48.4	-48.4	-48
Shielding (Barrier Attenuation)	7,878.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		18.8	-48.4	-48.4	-48.4	-48.4	48.
60 Minute Hourly Adjustmen		18.8	-48.4	-48.4	-48.4	-48.4	-48
Observer Location: R3			Project N	lame: Knox	Business Park		
Source: P47	-		Job Nu	mber: 9349			
Condition: Cumulati	ve Developments		An	alyst: A. Wc	lte		
	ION	se model	- INPUTS				
Noise Distance to Observer	6,683.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	6,683.0 feet			Noise S	ource Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Barı	ier Type (0-I	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distance ling of distar	e 8
	NOISE	MODEL PF	OJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	R4	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	6,683.0	-47.0	-47.0	-47.0	-47.0	-47.0	-47.
Shielding (Barrier Attenuation)	6,683.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		20.2	-47.0	-47.0	-47.0	-47.0	-47.

Condition: Cumulati			Inh Mi	mhar: 0340			
	ve Developments		A	nalyst: A. Wu	olfe		
	Ň	ISE MODEL	- INPUTS				
Noise Distance to Observer	6,787.0 feet			8	Barrier Height:	0.0	feet
Noise Distance to Barrier:	6,787.0 feet			Noise :	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			OL	oserver Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc ling of dista	e Jce
	NOISE	MODEL P	SOJECTIC	SNO			
Noise Level	Distance (feet)	Leq	L50	125	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	6,787.0	-47.1	-47.1	-47.1	-47.1	-47.1	1
Shielding (Barrier Attenuation)	6,787.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		20.1	-47.1	-47.1	-47.1	-47.1	7
60 Minute Hourly Adjustment		20.1	-47.1	-47.1	-47.1	-47.1	7
Observer Location: R4 Source: RC10			Project , Job Nu	Name: Knox Imber: 9349	Business Park		
Condition: Cumulati	ve Developments		A	nalyst: A. Wi	olfe		
	NO	ISE MODEI	- INPUTS				
Noise Distance to Observer	0,516.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	0,516.0 feet			Noise :	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Of	server Height:	5.0	feet
Ohserver Flevation	0.0 feet		Baı	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc ling of dista	e Jce
	NOISE	MODEL PI	SOJECTIC	SNO			
Noise Level	Distance (feet)	req	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	10,516.0	-50.9	-50.9	-50.9	-50.9	-50.9	Ÿ
Shielding (Barrier Attenuation)	10,516.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		16.3	-50.9	-50.9	-50.9	-50.9	
	_						

Source: RC6			Project N	lame: Knox	Business Parl	~	
CONTRINUT. CUITINIAN	ve Developments		Job Nur An	mber: 9349 alyst: A. Wc	olfe		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	11,647.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	11,647.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob.	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Barr	ier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dout	ng of distanc	800
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	11,647.0	-51.8	-51.8	-51.8	-51.8	-51.8	-51.
Shielding (Barrier Attenuation)	11,647.0	0.0	0.0	0.0	0.0	0.0	ō
Raw (Distance + Barrier)		15.4	-51.8	-51.8	-51.8	-51.8	-51.
60 Minute Hourly Adjustmen	-	15.4	-51.8	-51.8	-51.8	-51.8	- 5 1.
Observer Location: R4			Project N	lame: Knox	Business Parl	ž	
Source: RC2			Job Nui	mber: 9349			
Condition: Cumulati	ve Developments		An	<i>ialyst:</i> A. Wc	olfe		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	1,965.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	1,965.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob.	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Barr	ier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient.	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dout	ng of distano ding of distar	90
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	рөд	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	1,965.0	-36.3	-36.3	-36.3	-36.3	-36.3	-36.
Shielding (Barrier Attenuation)	1,965.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		30.9	-36.3	-36.3	-36.3	-36.3	-36.

Source: RC13 Condition: Cumulativ			Linalori	VALUE: NIUX	Business rai	×	
Condition: Cumulativ			Job Nu	mber: 9349			
	e Developments		Ar	ialyst: A. Wo	olfe		
	SION	SE MODEL	INPUTS				
Noise Distance to Observer	1,343.0 feet			ũ	arrier Height.	. 0.0	feet
Noise Distance to Barrier:	1,343.0 feet			Noise S	Source Height	: 8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height	: 5.0	feet
Other Plant and Other			Bar	rier Type (0-	Wall. 1-Berm)	0	
UDSERVER Elevation: Moise Source Elevation:	0.0 foot			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per doul	ing of distanc	e Jce
	NOISE	NODEL PR	OJECTIO	NS			
Noise Level	Distance (feet)	bəŢ	L50	L25	18	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	11,343.0	-51.6	-51.6	-51.6	-51.6	-51.6	-51
Shielding (Barrier Attenuation)	11,343.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		15.6	-51.6	-51.6	-51.6	-51.6	-51
60 Minute Hourly Adjustment		15.6	-51.6	-51.6	-51.6	-51.6	-5
Observer Location: R4			Project N	Vame: Knox	Business Par	×	
Source: RC15			Job Nu	mber: 9349			
Condition: Cumulativ	e Developments		Ar	ialyst: A. Wo	olfe		
	NOI	se model	INPUTS				
Noise Distance to Observer	7,904.0 feet			αĵ	arrier Height.		feet
Noise Distance to Barrier:	7,904.0 feet			Noise S	source Height	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height	: 5.0	feet
Observer Elevation:	0.0 feet		Ban	rier Type (0-	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per doul	ing of distanc bling of distar	e Jce
	NOISE	NODEL PR	OJECTIO	NS			
Noise Level	Distance (feet)	req	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	7,904.0	-48.4	-48.4	-48.4	-48.4	-48.4	-48
Shielding (Barrier Attenuation)	7,904.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		18.8	-48.4	-48.4	-48.4	-48.4	-48
to minite dama de		0 07	1 01	1 01	101	101	SV-

Source: P20 Condition: Cumulati			Project I	vame: Knox	Business Par	×	
	/e Developments		Job NL A	umber: 9349 nalyst: A. Wo	olfe		
	ION	SE MODE	L INPUTS				
Noise Distance to Observer	9,072.0 feet			ā	arrier Height:	0.0	feet
Noise Distance to Barrier:	9,072.0 feet			Noise S	Source Height		feet
Barrier Distance to Observer:	0.0 feet			90	server Height.	5.0	feet
Observer Flevetion:	0.0 foot		Bar	rier Type (0-	Wall, 1-Berm)	0	
Noise Source Flevation:	0.0 feet			Drop (Off Coefficient	: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per doul	ng of distanc oling of distar	906
	NOISE	MODEL PI	ROJECTIC	SNG			
Noise Level	Distance (feet)	рөд	L50	L25	18	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	9,072.0	-49.6	-49.6	-49.6	-49.6	-49.6	-49.
Shielding (Barrier Attenuation)	9,072.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		17.6	-49.6	-49.6	-49.6	-49.6	-49.
60 Minute Hourly Adjustmen:		17.6	-49.6	-49.6	-49.6	-49.6	-49.
Observer Location: R4			Project I	Vame: Knox	Business Par	×	
Source: RC12 Condition: Cumulati	ve Develonments		JOD NL	imber: 9349 nalvst: A Wr	lfe		
	ION .	SE MODE	L INPUTS	1			
Noise Distance to Ubserver	6,922.0 teet			αί.	arrier Height.	0.0	teet
Noise Distance to Barrier.	6,922.0 feet			s asion	source Height senver Height	0.0 	feet
Barrier Distance to Observer.	0.0			20	server mergin.	0.0	ממו
Observer Elevation:	0.0 feet		Baı	rier Type (0-	Wall, 1-Berm)	• ;	
Noise Source Elevation:	0.0 feet			Drop (Dtt Coetticient	: 15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per doul	ng of distano oling of distar	80
	NOISE	MODEL PI	ROJECTIC	SNG			
Noise Level	Distance (feet)	bəŢ	T50	L25	87	<i>L2</i>	Lmax
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	6,922.0	-47.1	-47.1	-47.1	-47.1	-47.1	-47.
Shielding (Barrier Attenuation)	6,922.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		13.0	-47.1	-47.1	-47.1	-47.1	-47.
60 Minute Hourly Adjustment				ļ	!		!

Source: FC/22 Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:					Business Park		
<i>Conation:</i> Cumulativ Noise Distance to Observer Noise Distance to Barrier:			nn aor	mber: 9349	- 14 -		
Noise Distance to Observer Noise Distance to Barrier:	e Developments		AI	nalyst: A. Wo	olte		
Noise Distance to Observer Noise Distance to Barrier:	ION	SE MODEL	- INPUTS				
Noise Distance to Barrier:	2,057.0 feet			8	arrier Height:	0.0	feet
	2,057.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Observer Elevention			Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of dista	e
	NOISE	MODEL PF	SOLECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	2,057.0	-36.7	-36.7	-36.7	-36.7	-36.7	φ
Shielding (Barrier Attenuation)	2,057.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		30.5	-36.7	-36.7	-36.7	-36.7	ę
60 Minute Hourly Adjustment		30.5	-36.7	-36.7	-36.7	-36.7	ę
Observer Location: R5 Source: RC6			Project I .Inh Mi	Vame: Knox	Business Park		
Condition: Cumulativ	e Developments		A	niber. 3349 nalyst: A. Wo	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer	2,511.0 feet			B	arrier Height:	0.0	feet
Noise Distance to Barrier:	2,511.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Observer Flevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of dista	e Jce
	NOISE	MODEL PF	SOJECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	87	<i>L2</i>	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	12,511.0	-52.4	-52.4	-52.4	-52.4	-52.4	Ŷ
Shielding (Barrier Attenuation)	12,511.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		14.8	-52.4	-52.4	-52.4	-52.4	Ÿ
And the second sec				1	1	:	

Source: P47			Dmind N	Iame Knov	Rucinece Da	<u>ب</u>	
			under v	mher: 9349		2	
Condition: Cumulativ	/e Developments		An	alyst: A. Wo	lfe		
	N	ISE MODEI	L INPUTS				
Noise Distance to Observer	6,268.0 feet			ä	arrier Height	: 0.0	feet
Noise Distance to Barrier:	6,268.0 feet			Noise S	ource Heighi senver Heighi		feet feet
barrier Distance to Ubserver.	U.U leet			20			וממו
Observer Elevation:	0.0 feet		Barr	rier Type (0-1	Wall, 1-Berm,	;0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficien	ť: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubl 4.5 dBA per dou	ing of distanc Ibling of dista	ie nce
	NOISE	MODEL PI	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	6,268.0	-46.4	-46.4	-46.4	-46.4	-46.4	-46.
Shielding (Barrier Attenuation)	6,268.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		20.8	-46.4	-46.4	-46.4	-46.4	-46.
60 Minute Hourly Adjustment		20.8	-46.4	-46.4	-46.4	-46.4	-46.
Observer Location: R4 Source: RC1			Project N Job Nui	<i>lame:</i> Knox <i>mber:</i> 9349	Business Paı	×	
Condition: Cumulativ	/e Developments		An	ialyst: A. Wo	lfe		
	ON	ISE MODEI	L INPUTS				
Noise Distance to Observer	103.0 feet			ä	arrier Height		feet
Noise Distance to Barrier:	103.0 feet			Noise S	ource Heigh	ť: 8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height	5.0	feet
Observer Elevation:	0.0 feet		Barı	rier Type (0-1	Wall, 1-Berm,	. 0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficien	ť: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubl 4.5 dBA per dou	ing of distanc Ibling of dista	e Doe
	NOISE	MODEL PI	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	103.0	-10.7	-10.7	-10.7	-10.7	-10.7	-10.
Shielding (Barrier Attenuation)	103.0	0.0	0.0	0.0	0.0	0.0	0.
Raw (Distance + Barrier)		56.5	-10.7	-10.7	-10.7	-10.7	-10.

Condition: Cumulative			Job Nu	Jame: Knox mber: 9349	Business Park		
	Developments		An	alyst: A. Wo	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer 9,	176.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier: 9.	176.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			ЙО	server Height:	5.0	feet
Observer Flevation	0.0 feet		Ban	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of distar	ee
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level Di	stance (feet)	Leq	L50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	9,176.0	-49.7	-49.7	-49.7	-49.7	-49.7	-49.
Shielding (Barrier Attenuation)	9,176.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		17.5	-49.7	-49.7	-49.7	-49.7	-49.
60 Minute Hourly Adjustment		17.5	-49.7	-49.7	-49.7	-49.7	-49.
Observer Location: R5 Source: P20			Project Nu	Jame: Knox mber: 9349	Business Park		
Condition: Cumulative	Developments		An	alyst: A. Wo	olfe		
	ION	SE MODEL	- INPUTS				
Noise Distance to Observer 7,	634.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier: 7,	634.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			ЙО	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bari	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of distar	ee
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level Di	stance (feet)	Leq	L50	L25	78	<i>L2</i>	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.
Distance Attenuation	7,634.0	-48.1	-48.1	-48.1	-48.1	-48.1	-48.
Shielding (Barrier Attenuation)	7,634.0	0.0	0.0	0.0	0.0	0.0	o.
Raw (Distance + Barrier)		19.1	-48.1	-48.1	-48.1	-48.1	-48.
60 Minute Hourly Adjustment		19.1	-48.1	-48.1	-48.1	-48.1	-48.

Observer Location: R5 Source: RC2 Condition: Cumulative Developments Source: RC2 Condition: Cumulative Developments Noise Distance to Observer: 1,980.0 feet Barrier Distance to Observer: 1,980.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Parrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Reference (Sample) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance Attenuation) 1,080.0 Raw (Distance Attenuation) 1,000.0 Raw (Distance Atte	MODEL PR 99 00 67.2 667.2 30.8 30.8 30.8 30.8	Project N Job Nu Job Nu Ar Ar Bar Bar Bar -36.4 -36.4 -36.4	<i>dame:</i> Knox <i>mber:</i> 9349 <i>aliyst:</i> A. Wo <i>B</i> <i>Noise</i> 5 <i>Cb</i> <i>Drop</i> (0- <i>Drop</i> (0- <i>Drop</i> (0- 15 = 15 26 = - 26.4 .36.4 .00	Business Par olfe arrier Height Source Height Source Height Annu 1-Berm Off Coefficienn - 45 dBA per doub - 45 dBA per doub - 45 dBA per doub - 60 - 00 - 00 - 00 - 00 - 00 - 00 - 00	K 0.0 :: 5.0 :: 5.0.0 :: 20.0 ing of distant ing of distant	feet feet feet
Source: RC2 Condition: Cumulative Developments Noise Distance to Observer 1,980.0 feet Barrier Distance to Observer: 1,980.0 feet Barrier Distance to Observer: 1,980.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Distance (feet) Lei Reference (Sample) 30.0 Distance Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance Attenuation) 1,00.0	MODEL PR 99 67.2 67.2 30.8 30.8 30.8 30.8 CE NOIS	Job Nu Ar Ar Bar Bar Bar 150 150 - 150 - 150 - 150 - 16.4 - 36.4 - 36.4	mber: 9349 makyst: A. Wc B B Nolse & Dop (Drop (15 = 15 = 15 = .36.4 .00	olfe larrier Height Source Height Nall, 1-Berm, Off Coefficient 1-Berm, Off Coefficient 2-8 Ab Per doub 2-8 - 0.0 0.0	0.0 0.0 1 8.0 1 5.0 1 20.0 1 20.0 1 20.0 1 20.0 1 20.0	feet feet feet
Condition: Cumulative Developments Noise Distance to Observer: 1,980.0 feet Noise Distance to Observer: 0.0 feet Barrier Distance to Observer: 0.0 feet Noise Source Elevation: 0.1 feet Noise Source Elevation: 0.1 feet Noise Source Elevation: 0.1 feet Noise Level NOISE MOD Reference (Sample) 30.0 Distance (feet) Lei Raw (Distance Harrier) 1,980.0 Raw (Distance Harrier) 30.0 Raw (Distance Harrier) 1,980.0 Raw (Distance Harrier) 0.0 Raw (Distance Harrier) 0.0 </td <td>MODEL PR 99 67.2 67.2 30.8 30.8 30.8 30.8 5E NOISE</td> <td>Ar INPUTS Ben 0.0 -36.4 -36.4 -36.4</td> <td>B Noise 5 Noise 5 0b Drop (15 = 15 = 15 = .36.4 0.0</td> <td>olfe iarrier Height Source Height Source Height Source Height </td> <td> 0.0 8.0 5.0 0.0 5.0 0 0 0 0 0 0 0 0 20.0 1 0 0 20.0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0</td> <td>feet feet feet noe</td>	MODEL PR 99 67.2 67.2 30.8 30.8 30.8 30.8 5E NOISE	Ar INPUTS Ben 0.0 -36.4 -36.4 -36.4	B Noise 5 Noise 5 0b Drop (15 = 15 = 15 = .36.4 0.0	olfe iarrier Height Source Height Source Height Source Height 	0.0 8.0 5.0 0.0 5.0 0 0 0 0 0 0 0 0 20.0 1 0 0 20.0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0	feet feet feet noe
NOISE N Noise Distance to Observer: 1,980.0 feet Noise Distance to Observer: 0.0 feet Barrier Distance to Observer: 0.0 feet Cobserver Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Level Distance (feet) Noise Level Distance (feet) Noise Level 1,980.0 Distance Attenuation 1,980.0 Reference (Sample) 1,980.0 Distance Attenuation 1,980.0 Raw (Distance Hourly Adjustment 1,980.0 Raw (Distance Plarrier) 0.0 feet Barrier Elevation: Noise Distance to Observer: Condition: Cumulative Developments Noise Distance to Observer: Noise Distance to Observer: 0.0 feet Noise Distance to Obse	MODEL PR 99 67.2 67.2 30.8 30.8 30.8 30.8	Bar 0.0 0.0 0.0 0.0 0.0 -36.4 -36.4 -36.4	B Noise 5 Ob Noise 6 Drop (15 = 15 = .36.4 0.0	tarrier Height server Height Source Height Source Height -Wall, 1-Berm) Off Coefficient - 45 dBA per doub - 45 dBA per dou - 18 - 36, 4	0.0 :: 0.0 :: 5.0 :: 20.0 :: 20.0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0 :: 0	feet feet nce
Noise Distance to Observer 1,980.0 feet Noise Distance to Barrier: 1,980.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Level Distance (feet) Istance (Sample) 1,980.0 Distance Haustion 1,980.0 Reference (Sample) 1,980.0 Distance Haustion 1,980.0 Reference (Sample) 1,980.0 Reference Sample) 1,980.0 Noise Distance Hourly Adjustment 1,980.0 Raw (Distance Hourly Adjustment 1,980.0 Raw (Distance Plantier) 0 Barrier Elevation: 0.0 feet Noise Distance to Observer: 0.0 feet Noise Source Elevation: 0.0 feet <	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	Ban OJECTIO 0.0 -36.4 -36.4 -36.4	B Noise 5 Ob Drop (0- 15 = 15 = 15 = .36.4 0.0	Harrier Height Source Height Source Height New Wall, 1-Berm Off Coefficien Off Coefficien e 4.5 dBA per dou e 4.5 dBA per dou 2.0 -36.4	: 0.0	feet feet nce nce
Noise Distance to Barrier: 1,980.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Reference (Sample) 0.0 feet Noise Level Distance (feet) Lei Reference (Sample) 30.0 30.0 Distance Attenuation 1,980.0 1,980.0 Reference (Sample) 30.0 1,980.0 Reference (Sample) 1,980.0 30.0 Distance Attenuation 1,980.0 1,980.0 Reference (Sample) 1,980.0 1,980.0 Reference (Sample) 1,980.0 1,980.0 Reterence (Sample) 1,980.0 1,980.0 Source: P13 20000 1,980.0 <t< td=""><td>DEL PR 67.2 67.2 0.0 30.8 30.8 30.8</td><td>Ban OJECTIO 0.0 0.0 0.0 -36.4 -36.4</td><td>Noise 5 Ob Drop (0- Drop (0- 15 = 15 = 15 = 0.0 0.0</td><td>Source Height Nerver Height Off Coefficienti e 45 dBA per dou - 45 dBA per dou - 46 dBA per dou - 46 dBA per dou - 46 dBA per dou - 60 dBA</td><td>:: 8.0 : 5.0): 0 t: 20.0 ing of distant bling of distant</td><td>feet feet nœ</td></t<>	DEL PR 67.2 67.2 0.0 30.8 30.8 30.8	Ban OJECTIO 0.0 0.0 0.0 -36.4 -36.4	Noise 5 Ob Drop (0- Drop (0- 15 = 15 = 15 = 0.0 0.0	Source Height Nerver Height Off Coefficienti e 45 dBA per dou - 45 dBA per dou - 46 dBA per dou - 46 dBA per dou - 46 dBA per dou - 60 dBA	:: 8.0 : 5.0): 0 t: 20.0 ing of distant bling of distant	feet feet nœ
Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Level Distance (feet) Istance Attenuation 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance Hourty Adjustment 30.0 Condition: Cumulative Developments 1,980.0 Raw (Distance to Barrier: 5,980.0 feet Noise Distance to Barrier: 0.0 feet Noise Distance to Barrier: 0.0 feet Noise Distance to Barrier: 0.0 feet Noise Source: Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	90 67.2 67.2 67.2 0.0 30.8 30.8 30.8 30.8	Ben 001ECTIO 0.0 -36.4 -36.4	Ob rier Type (0- Drop (0- 15 = 15 = 15 = .36.4 0.0 0.0	sserver Height Wall, 1-Berm) Off Coefficienn Off Coefficienn e 45 dBA per doubl = 4.5 dBA per doubl = 4.5 dBA per doubl - 4.5 dBA per doubl - 36.4 - 36.4	: 5.0): 0 <i>t</i> : 20.0 hing of distant	feet nce
Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Barrier Elevation: 0.0 feet Noise Level Distance freet) Noise Level 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance Attenuation) 1,980.0 Raw (Distance Hourly Adjustment 1,980.0 Route Hourly Adjustment 1,980.0 Robserver Location: R5 Source: P13 Source: P13 Condition: Cumulative Developments Noise Distance to Observer: 5,980.0 feet Noise Distance to Observer: 5,980.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	010 EL PR 67.2 67.2 30.8 30.8 30.8 30.8	Ban OJECTIO 0.0 -36.4 -36.4 -36.4	nier Type (0- Drop (20 = 15 = 15 = -36.4 0.0 0.0	Wall, 1-Berm) Off Coefficient 6 6BA per doubl = 4.5 6BA per dou = 4.5 6BA per dou = 4.5 6BA per dou = 36.4 - 36.4): 0 t: 20.0 ing of distanr biling of dista	e e e
Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet Reference Sample) 0.0 feet Noise Level Distance fleetin Len Noise Level Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance - Barrier) 1,980.0 Ramoter Location: R5 Source: P13 Source: P13 Condition: Cumulative Developments Noise Distance to Deserver: 5,980.0 feet Noise Distance to Deserver: 5,980.0 feet Noise Distance to Deserver: 5,980.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	99 FR 67.2 -36.4 - 0.0 30.8 30.8 30.8 30.8 30.8 30.8	OJECTIO 150 1.0 -36.4 -36.4	Drop (20 = 0 15 = 1 15 = 0 0.0 0.0	Off Coefficien = 6 dBA per doubl = 4.5 dBA per doubl = 4.5 dBA per dou = 4.5 dBA per dou = 4.5 dBA per dou = 36.4 - 36.4 - 0.0	<i>t</i> : 20.0 ing of distant bling of distant	90
Molse Level Noise Level Reference (Sample) 0.0 feet Noise Level Distance freet) Lei 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance Attenuation) 1,980.0 Raw (Distance Hourly Adjustment 1,980.0 Raw (Distance Hourly Adjustment 1,980.0 Raw (Distance Barrier) 0.0 feet Annute Hourly Adjustment Noise Distance to Barrier 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	010EL PR 67.2 67.2 0.0 30.8 30.8 30.8 30.8	OJECTIO <u>L50</u> 0.0 -36.4 -36.4 -36.4	20 = 15 = 15 = 15 = 15 = 20.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	: 6 dBA per doubl : 4.5 dBA per doubl : 4.5 dBA per dou .4.5 dBA per dou : 4.5 dBA per doubl : 4.5 dBA per doubl : 4.5 dBA per doubl : 4.5 dBA per doubl	ing of distant Ibling of dist <i>e</i>	9.00
Noise Level Noise Moi Reference (Sample) 30.0 Distance Attenuation 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance + Barrier) 1,980.0 Barrier Hourty Adjustment 1,980.0 Noise Distance to Barrier 5,980.0 Noise Distance to Observer 0.0 feet Noise Distance to Observer 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	99 FR 67.2 -36.4 - 0.0 30.8 30.8 30.8 30.8 30.8 30.8	OJECTIO 150 0.0 -36.4 0.0 -36.4 -36.4	15 = 15 = 15 = 15 = 15 = 15 = 15 = 15 =	: 4.5 dBA per dou L8 0.0 -36.4	bling of dista	nce
Noise Level NOISE MOI Reference (Sample) Distance (feet) Lei Reference (Sample) 30.0 30.0 Distance Attenuation 1,980.0 30.0 Shielding (Barrier Attenuation) 1,980.0 30.0 Revelopment 1,980.0 30.0 Revelopment 1,980.0 30.0 Revelopment 1,980.0 30.0 Revelopment 1,980.0 30.0 Source + Barrier) Stanton built 1,980.0 Revelopments Source: P13 200.0 Noise Distance to Observer 5,980.0 feet Noise Distance to Observer 0.0 feet Noise Distance to Observer 0.0 feet Noise Distance to Observer 0.0 feet Noise Source Elevation: 0.0 feet	DEL PR 99 67.2 67.2 0.0 30.8 30.8 30.8 30.8	OJECTIO <u>150</u> -36.4 -36.4 -36.4 -36.4	NS <i>L25</i> 0.0 -36.4 0.0	18 0.0 -36.4		
Noise Level Distance (freet) Lei Reference (Sample) 30.0 Distance Attenuation 1,980.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance + Barrier) 1,980.0 Startier Location: R5 Source: P13 Condition: Cumulative Developments Noise Distance to Barrier: 5,980.0 feet Noise Distance to Observer: 5,980.0 feet Noise Distance to Observer: 5,980.0 feet Noise Distance to Observer: 5,980.0 feet Noise Distance to Observer: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	99 67.2 -36.4 0.0 30.8 30.8 30.8 5E NOIS	450 -36.4 -36.4 -36.4 -36.4	<i>L25</i> 0.0 -36.4 0.0	L8 0.0 -36.4		
Reference (Sample) 30.0 Distance Attenuation 1,880.0 Shielding (Barrier Attenuation) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance + Barrier) 1,980.0 Raw (Distance + Barrier Elevelopments StartIONARY SOURC Observer Location: R5 Source: P13 Condition: Cumulative Developments Noise Distance to Observer 5,980.0 feet Noise Distance to Observer 5,980.0 feet Noise Distance to Observer 5,980.0 feet Barrier Distance to Observer 5,980.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet	67.2 -36.4 0.0 30.8 30.8 30.8	0.0 -36.4 0.0 -36.4	0.0 -36.4 0.0	0.0 -36.4	L2	Lma
Distance Attenuation 1,880.0 Raw (Distance + Barrier) 1,880.0 Raw (Distance + Barrier) 1,880.0 Raw (Distance + Barrier) 1,880.0 Raw (Distance + Barrier Est Sauros: P13 Condition: Cumulative Developments Noise Distance to Barrier 5,980.0 feet Noise Distance to Deserver 5,980.0 feet Rarrier Distance to Deserver 5,980.0 feet Noise Distance to Deserver 5,980.0 feet Rarrier Distance to Deserver: 0.0 feet Rarrier Distance to Deserver: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	-36.4 0.0 30.8 30.8 30.8	-36.4 0.0 -36.4 -36.4	-36.4 0.0	-36.4	0.0	
Shielding (Barrier Attenuation) 1,880.0 Raw (Distance + Barrier) 60 Minute Hourly Adjustment StATIONARY SOURC Observer Location: R5 Source: P13 Condition: Cumulative Developments Source: P13 Condition: Cumulative Developments Noise Distance to Barrier: 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Barrier Distance to Observer: 5,980.0 feet Noise Distance to Observer: 5,980.0 feet Rarrier Distance to Observer: 0.0 feet Barrier Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	0.0 30.8 30.8 30.8	0.0 -36.4 -36.4	0.0	00	-36.4	Ŷ
Raw (Distance + Barrier) 60 Minute Hourly Adjustment STATIONARY SOURC Cobserver Location: R5 Source: P13 Condition: Cumulative Developments Source: P13 Condition: Cumulative Developments Source: P13 Condition: Cumulative Developments Source: P13 Condition: Cumulative Developments Source: P13 Condition: Cumulative Developments Noise Distance to Observer 5, 980.0 feet Noise Distance to Observer: 5, 980.0 feet Barrier Distance to Observer: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	30.8 30.8 CE NOISE	-36.4 - 36.4		2.2 2	0.0	
60 Minute Hourty Adjustment STATIONARY SOURC Choserver Location: R5 Source: P13 Source: P13 Condition: Cumulative Developments Source: P13 Condition: Cumulative Developments Source: P13 Source: Condition: Cumulative Developments Source: Condition: Comulative Developments Noise Distance to Barrier: 5,380.0 feet Noise Distance to Deserver: 5,380.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet	30.8 CE NOISE	-36.4	-36.4	-36.4	-36.4	Ŷ
STATIONARY SOURC Observer Location: R5 Source: P13 Source: P13 Condition: Cumulative Developments Condition: Cumulative Developments Noise Distance to Observer 5,980.0 feet Noise Distance to Observer 5,980.0 feet Noise Distance to Observer 5,980.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet	CE NOISE		-36.4	-36.4	-36.4	Ŷ
Source: P13 Condition: Cumulative Developments Noise Distance to Observer 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet		Project I	Vame: Knox	: Business Par	¥	
Condition: Cumulative Developments Noise Distance to Observer 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet		Inh dol	mher 9340			
Noise Distance to Observer 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Barrier Distance to Diserver: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet		Ar	nalyst: A. Wo	olfe		
Noise Distance to Observer 5,980.0 feet Noise Distance to Barrier: 5,980.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet	MODEL	INDUTS				
Noise Distance to Barrier: 5,990.0 feet Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet			8	Jarrier Heicht	00	feet
Barrier Distance to Observer: 0.0 feet Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet			Noise S	Source Heiahi	8.0	feet
Observer Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet			qO	server Height	5.0	feet
Noise Source Elevation: 0.0 feet Barrier Elevation: 0.0 feet		Bari	rier Type (0-	Wall, 1-Berm	0	
Barrier Elevation: 0.0 feet			Drop (Off Coefficien	ť: 20.0	
			20 = 15 =	= 6 dBA per doubl = 4.5 dBA per dou	ing of distant Ibling of dista	e nce
NOISE MOL	DEL PR	OJECTIO	SN			
Noise Level Distance (feet) Lev	be	<i>L50</i>	L25	87	<i>L2</i>	Lma
Reference (Sample) 30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation 5,980.0	-46.0	-46.0	-46.0	-46.0	-46.0	4
Shielding (Barrier Attenuation) 5,980.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)	21.2	-46.0	-46.0	-46.0	-46.0	4
60 Minute Hourly Adjustment	21.2	-46.0	-46.0	-46.0	-46.0	Y

Source: RC15 Condition: Cumulativ				Value. NIUX	BUSINESS Park		
Condition: Cumulativ			Job Nu	<i>umber:</i> 9349			
	e Developments		A	nalyst: A. Wc	olfe		
	ION	SE MODEL	L INPUTS				
NOISE DISTANCE TO UDSERVER	7,203.0 feet			Ø	arrier Height:	0.0	feet
Noise Distance to Barrier:	7,203.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			0p	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublin = 4.5 dBA per doubl	g of distanc ing of distar	e
	NOISE	MODEL PF	SOJECTIO	SNO			
Noise Level	Distance (feet)	Leq	L50	125	18	L2	Γm
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	7,203.0	-47.6	-47.6	-47.6	-47.6	-47.6	
Shielding (Barrier Attenuation)	7,203.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		19.6	-47.6	-47.6	-47.6	-47.6	•
60 Minute Hourly Adjustment		19.6	-47.6	-47.6	-47.6	-47.6	í
Observer Location: R5 Source: P47			Project I Job Nu	Name: Knox Imber: 9349	Business Park		
Source: P47 Condition: Cumulativ	e Develonments		JUD INL	imber. 9349 Jalvst: A Wr	olfe		
		SE MODEI	INDUTS		2		
Moice Distance to Observer	E 240 0 foot				Device Holeht.	00	1009
Noise Distance to Observer	0,240.0 1661			Noice o	Source Height:		
Noise Distance to Barrier.	5,248.0 Teet				source rreight. server Heinht [.]	0.0	feet
barrier Distance to Observer.	U.U Teet			20	אפו אפו ז ופואוווי	0.0	100
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0 0	
Noise Source Elevation:	0.0 feet			nrop (UT COETICIENT	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublin = 4.5 dBA per doubl	g of distanc ing of distar	e
	NOISE	MODEL PF	SOJECTIO	SNG			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Γu
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	5,248.0	-44.9	-44.9	-44.9	-44.9	-44.9	Ċ
Shielding (Barrier Attenuation)	5,248.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		22.3	-44.9	-44.9	-44.9	-44.9	'
60 Minute Hourly Adjustment		22.3	-44.9	-44.9	-44.9	-44.9	'

Source: RC12			Project I	Vame: Knox	Business Parl		
			Job Nu	mber: 9349			
Condition: Cumulativ	e Developments		Ar	nalyst: A. Wo	olfe		
	ION	SE MODEL	INPUTS				
Noise Distance to Observer	5,514.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	5,514.0 feet			Noise S	source Height:	5.0	feet
Barrier Distance to Observer:	0.0 feet			Ob.	server Height:	5.0	feet
Ohserver Elevation:	0.0 feet		Bar.	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dout	ng of distanc ding of dista	e Joe
	NOISE	MODEL PR	OJECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	
Distance Attenuation	5,514.0	-45.6	-45.6	-45.6	-45.6	-45.6	4
Shielding (Barrier Attenuation)	5,514.0	0.0	0.0	0.0	0.0	0.0	-
Raw (Distance + Barrier)		14.5	-45.6	-45.6	-45.6	-45.6	4
60 Minute Hourly Adjustment		14.5	-45.6	-45.6	-45.6	-45.6	4
Observer Location: R5			Project I	<i>Vame:</i> Knox	Business Park	Ļ	
Source: RC13			UN dol	mber: 9349			
Condition: Cumulativ	e Developments		Ar	nalyst: A. Wo	olfe		
	ION	SE MODEL	INPUTS				
Noise Distance to Observer	9,972.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	9,972.0 feet			Noise S	source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob.	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dout	ng of distanc ling of distar	e Joe
	NOISE	MODEL PR	OJECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	-
Distance Attenuation	9,972.0	-50.4	-50.4	-50.4	-50.4	-50.4	-2
Shielding (Barrier Attenuation)	9,972.0	0.0	0.0	0.0	0.0	0.0	-
Raw (Distance + Barrier)		16.8	-50.4	-50.4	-50.4	-50.4	Ϋ́
60 Minute Hourly Adjustment		0.07		103			i

Condition: Cumulativ Noise Distance to Observer			und dol.	mber: 9349			
Noise Distance to Observer	ve Developments		Ar	nalyst: A. Wo	olfe		
Noise Distance to Observer	ION	SE MODEL	. INPUTS				
	1,970.0 feet			Ø	arrier Height:	0.0	feet
Noise Distance to Barrier:	1,970.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Obcontor Elocation :			Bar	rier Type (0-	Wall, 1-Berm):	0	
Observer Elevation. Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	: 6 dBA per doubling : 4.5 dBA per doubli	g of distanc ing of dista	e
	NOISE	MODEL PF	COLECTIO	SN			
Noise Level	Distance (feet)	bəŢ	L50	L25	78	L2	Lmé
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	11,970.0	-52.0	-52.0	-52.0	-52.0	-52.0	'
Shielding (Barrier Attenuation)	11,970.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		15.2	-52.0	-52.0	-52.0	-52.0	•
60 Minute Hourly Adjustment		15.2	-52.0	-52.0	-52.0	-52.0	'
Observer Location: R6 Source: RC2 Condition: Cumulati	va Develonments		Project I Job Nu Ar	Vame: Knox Imber: 9349 Valvet: A Mic	Business Park		
CONTRINUT: CUITIULAIN	леvеюріпелы		Ŧ	iaiysi. A. wu	olle		
	ION	ISE MODEL	- INPUTS				
Noise Distance to Observer	1,392.0 feet			۵Ō	arrier Height:	0.0	feet
Noise Distance to Barrier:	1,392.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Flevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	: 6 dBA per doublin : 4.5 dBA per doubli	g of distanc ing of dista	e
	NOISE	MODEL PF	SOLECTIO	SN			
Noise Level	Distance (feet)	red	L50	L25	87	<i>L2</i>	Γm
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	1,392.0	-33.3	-33.3	-33.3	-33.3	-33.3	'
Shielding (Barrier Attenuation)	1,392.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		33.9	-33.3	-33.3	-33.3	-33.3	

Observer Location: R5 Source: RC1 Condition: Cumulativ							
Source: RC1 Condition: Cumulativ			Project N	<i>lame:</i> Knox	Business Park		
Condition: Cumulativ			Job Nu	mber: 9349			
	e Developments		Ar	alyst: A. Wc	olfe		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	223.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	223.0 feet			Noise S	source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Elevention:			Bari	rier Type (0-1	Wall, 1-Berm):	0	
Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distance ing of distan	. 8
	NOISE	MODEL PR	OJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ő
Distance Attenuation	223.0	-17.4	-17.4	-17.4	-17.4	-17.4	-17
Shielding (Barrier Attenuation)	223.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		49.8	-17.4	-17.4	-17.4	-17.4	-17
60 Minute Hourly Adjustment		49.8	-17.4	-17.4	-17.4	-17.4	-17
Observer Location: R5			Project N	<i>Jame:</i> Knox	Business Park		
Source: RC22	-		Job Nu	mber: 9349			
Condition: Cumulativ	/e Developments		Ar	ialyst: A. WC	lite		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	2,594.0 feet			ä	arrier Height:	0.0	feet
Noise Distance to Barrier:	2,594.0 feet			Noise S	source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			'qO	server Height:	5.0	feet
Ohservær Flevetion:	0.0 feet		Ban	rier Type (0-I	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distance ing of distan	8
	NOISE	MODEL PR	OJECTIO	NS			
Noise Level	Distance (feet)	Leq	<i>L50</i>	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ó
Distance Attenuation	2,594.0	-38.7	-38.7	-38.7	-38.7	-38.7	-38
Shielding (Barrier Attenuation)	2,594.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		28.5	-38.7	-38.7	-38.7	-38.7	-38
60 Minute Hourly Adjustment		28.5	-38.7	-38.7	-38.7	-38.7	-38
Source: P20 Condition: Cumulativ				VOINTO INTON		×	
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Condition: Cumulativ			JOD NL	umber: 9349			
	e Developments		A	nalyst: A. Wo	olfe		
	ION	ISE MODE	- INPUTS				
Noise Distance to Observer	7,560.0 feet			B	arrier Height:	0.0	feet
Noise Distance to Barrier:	7,560.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
			Bar	rier Type (0-	-Wall, 1-Berm):	0	
Observer Elevation: Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc bling of dista	e Jce
	NOISE	MODEL PI	SOJECTIC	SNO			
Noise Level	Distance (feet)	req	L50	L25	87	L2	Lma:
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	7,560.0	-48.0	-48.0	-48.0	-48.0	-48.0	1
Shielding (Barrier Attenuation)	7,560.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		19.2	-48.0	-48.0	-48.0	-48.0	7
60 Minute Hourly Adjustment		19.2	-48.0	-48.0	-48.0	-48.0	7
Observer Location: R6 Source: RC12			Project I Job NL	Name: Knox Imber: 9349	Business Park	¥	
Condition: Cumulativ	e Developments		A	nalyst: A. Wo	olfe		
	ION	ISE MODE	- INPUTS				
Noise Distance to Observer	5,647.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	5,647.0 feet			Noise S	Source Height:	5.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Baı	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc bling of dista	e
	NOISE	MODEL PI	SOJECTIC	SNG			
Noise Level	Distance (feet)	req	L50	L25	87	<i>L2</i>	Lme
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	
Distance Attenuation	5,647.0	-45.8	-45.8	-45.8	-45.8	-45.8	1
Shielding (Barrier Attenuation)	5,647.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		14.3	-45.8	-45.8	-45.8	-45.8	7
60 Minute Hourly Adjustment		C 11	-15 B	-45 0	45.0	45.0	'

Observer Location: R6 Source: P13							
Source: P13			Project I	Vame: Knox	Business Par	×	
			UN QOL	mber: 9349			
Condition: Cumulati	ve Developments		Ar	alyst: A. Wo	olfe		
	ION	SE MODEI	- INPUTS				
Noise Distance to Observer	5,395.0 feet			8	arrier Height.	: 0.0	feet
Noise Distance to Barrier:	5,395.0 feet			Noise 3	Source Height		feet
Barrier Distance to Observer:	0.0 feet			qo	server Height	: 5.0	feet
Ohserver Flevation	00 feet		Bar	rier Type (0-	Wall, 1-Berm)	0	
Noise Source Flevation	0.0 feet			Drop	Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	: 6 dBA per doubli : 4.5 dBA per dou	ing of distanc bling of dista	e nce
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	<i>L8</i>	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	O
Distance Attenuation	5,395.0	-45.1	-45.1	-45.1	-45.1	-45.1	-45.
Shielding (Barrier Attenuation)	5,395.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		22.1	-45.1	-45.1	-45.1	-45.1	-45.
60 Minute Hourly Adjustmen	_	22.1	-45.1	-45.1	-45.1	-45.1	-45.
Observer Location: R6 Source: RC10			Project I Job Nu	Vame: Knox mber: 9349	Business Par	×	
Condition: Cumulati	ve Developments		A	alyst: A. Wo	olfe		
	ION	SE MODEI	L INPUTS				
Noise Distance to Observer	9,407.0 feet			8	arrier Height.	: 0.0	feet
Noise Distance to Barrier:	9,407.0 feet			Noise 3	Source Height		feet
Barrier Distance to Observer:	0.0 feet			qo	server Height	: 5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli : 4.5 dBA per dou	ing of distanc bling of dista	ince
	NOISE	MODEL PF	SOJECTIO	SN			
Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	9,407.0	-49.9	-49.9	-49.9	-49.9	-49.9	-49.
Shielding (Barrier Attenuation)	9,407.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		17.3	-49.9	-49.9	-49.9	-49.9	-49.

Source: F4/ Condition: Cumulative D Noise Distance to Observer: 4,7(Noise Distance to Observer: Barrier Distance to Observer: Observer Elevation:			Project I	Vame: Knox	Business Park		
Condition: Cumulative D Noise Distance to Observer 4,7(Noise Distance to Barrier: 4,7(Barrier Distance to Observer: Observer Elevation:			nN qor	mber: 9349	;		
Noise Distance to Observer 4,7(Noise Distance to Barrier: 4,7(Barrier Distance to Observer: Observer Elevation:	evelopments		A	nalyst: A. Wo	olfe		
Noise Distance to Observer 4,7(Noise Distance to Barrier: 4,7(Barrier Distance to Observer: Observer Elevation:	ION	se model	- INPUTS				
Noise Distance to Barrier: 4,70 Barrier Distance to Observer: Observer Elevation:	04.0 feet			8	arrier Height:	0.0	feet
Barrier Distance to Observer: Observer Elevation:	04.0 feet			Noise S	Source Height:	8.0	feet
Observer Elevation:	0.0 feet			qo	server Height:	5.0	feet
UDSERVER Elevation:			Bar	rier Tvpe (0-	Wall. 1-Berm):	0	
Noise Source Flevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublir 4.5 dBA per doub	ng of distanc ling of distar	e Jce
	NOISE	MODEL PF	SOJECTIO	SN			
Noise Level Dist.	ance (feet)	req	L50	L25	18	L2	Lma.
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	4,704.0	-43.9	-43.9	-43.9	-43.9	-43.9	7
Shielding (Barrier Attenuation)	4,704.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		23.3	-43.9	-43.9	-43.9	-43.9	4
60 Minute Hourly Adjustment		23.3	-43.9	-43.9	-43.9	-43.9	4
Observer Location: R6			Project I	Vame: Knox	Business Park		
Source: RC22			UN doL	mber: 9349	-14		
Condition: Cumulative D	evelopments		А	naryst: A. wo	DITE		
	ION	se model	- INPUTS				
Noise Distance to Observer 2,12	20.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier: 2,12	20.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Observer Flevation	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublir 4.5 dBA per doub	ng of distanc ling of distar	e
	NOISE	MODEL PF	SOJECTIO	SN			
Noise Level Dist.	ance (feet)	Leq	L50	L25	87	L2	Lma
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	2,120.0	-37.0	-37.0	-37.0	-37.0	-37.0	Ŷ
Shielding (Barrier Attenuation)	2,120.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		30.2	-37.0	-37.0	-37.0	-37.0	Ŷ
60 Minute Hourly Adjustment		30.2	-37.0	-37 0	-37 0	-37.0	'n

							2102/15/
Observer Location: R6			Project N	<i>lame:</i> Knox	Business Par	×	
Source: RC13	va Davalonments		Job Nu Ar	mber: 9349	lfa		
		SE MODE			2		
Moise Distance to Observer	10 115 0 feet			à	thoing Hoine		faat
Moice Distance to Observer	10,14E 0 foot			Noise S	Source Heicht		faat
Barrier Distance to Observer:	0.0 feet			90	server Height.	5.0	feet
Observer Elevetion			Bari	rier Type (0-1	Wall, 1-Berm)	0	
Noise Source Flavation:	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per doul	ng of distanc bling of dista	e Joe
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	87	12	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ó
Distance Attenuation	10,145.0	-50.6	-50.6	-50.6	-50.6	-50.6	-20
Shielding (Barrier Attenuation)	10,145.0	0.0	0.0	0.0	0.0	0.0	Ő
Raw (Distance + Barrier)		16.6	-50.6	-50.6	-50.6	-50.6	-20
60 Minute Hourly Adjustmen	t	16.6	-50.6	-50.6	-50.6	-50.6	-20
Observer Location: R6			Project N	lame: Knox	Business Par	×	
Source: RC15			Job Nu	mber: 9349			
Condition: Cumulati	ve Developments		Ar	<i>alyst:</i> A. Wc	olfe		
	ION	SE MODE	IL INPUTS				
Noise Distance to Observer	7,758.0 feet			ä	arrier Height:	: 0.0	feet
Noise Distance to Barrier:	7,758.0 feet			Noise S	source Height	: 8.0	feet
Barrier Distance to Observer:	0.0 feet			'qO	server Height.	: 5.0	feet
Observer Elevation:	0.0 feet		Bari	rier Type (0-I	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per doul	ng of distanc bling of dista	e Joe
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	req	T50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ó
Distance Attenuation	7,758.0	-48.3	-48.3	-48.3	-48.3	-48.3	-48
Shielding (Barrier Attenuation)	7,758.0	0.0	0.0	0.0	0.0	0.0	Ó
Raw (Distance + Barrier)		18.9	-48.3	-48.3	-48.3	-48.3	48
CO Ministe Handle A diretter							

Source: P13 Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:				vame: hnox	(Business Park		
Condition: Cumulativ Noise Distance to Observer Noise Distance to Barrier:			JOD NL	imber: 9349			
Noise Distance to Observer Noise Distance to Barrier:	e Developments		A	alyst: A. W	olfe		
Noise Distance to Observer Noise Distance to Barrier:	NO	ISE MODEI	L INPUTS				
Noise Distance to Barrier:	4,551.0 feet			-	3arrier Height:	0.0	feet
	4,551.0 feet			Noise	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			10	bserver Height:	5.0	feet
Obsenser Elevetion:			Bar	rier Type (0	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20= 15=	= 6 dBA per doublin = 4.5 dBA per doub	ng of distanc ling of distar	e Ice
	NOISE	MODEL PI	SOJECTIO	SNO			
Noise Level	Distance (feet)	hed	L50	125	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	4,551.0	-43.6	-43.6	-43.6	-43.6	-43.6	-43
Shielding (Barrier Attenuation)	4,551.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		23.6	-43.6	-43.6	-43.6	-43.6	-43
30 Minute Hourly Adjustment		23.6	-43.6	-43.6	-43.6	-43.6	-43
Observer Location: R7 Source: RC10			Project I Job Nu	Vame: Knox Imber: 9349	K Business Park		
Source: RC10 Condition: Cumulativ	e Develonments		UN DOL	imber: 9349 nalvst ⁻ A W	olfe		
			ζ	iaiyət. A. w			
	NO	ISE MODEI	L INPUTS				
Noise Distance to Observer	8,149.0 feet			-	3arrier Height:	0.0	feet
Noise Distance to Barrier:	8,149.0 feet			Noise	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			10	bserver Height:	5.0	feet
Ohserver Flevation:	0.0 feet		Bar	rier Type (0	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublin = 4.5 dBA per doub	ng of distanc ling of distar	e
	NOISE	MODEL PI	SOJECTIO	SNO			
Noise Level	Distance (feet)	req	L50	L25	F8	L2	Lmax
teference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	8,149.0	-48.7	-48.7	-48.7	-48.7	-48.7	-48
Shielding (Barrier Attenuation)	8,149.0	0.0	0.0	0.0	0.0	0.0	0
Raw (Distance + Barrier)		18.5	-48.7	-48.7	-48.7	-48.7	-48
30 Minute Hourly Adjustment		18.5	-48.7	-48.7	-48.7	-48.7	-48

Courses DCc			Project N	Jame: Knox	Business Pa	ž	
Condition: Cumulati	ve Developments		Job Nu Ar	mber: 9349 alyst: A. Wo	olfe		
	ON	ISE MODEI	L INPUTS				
Noise Distance to Observer	12,679.0 feet			Ø	arrier Heigh	t: 0.0	feet
Noise Distance to Barrier:	12,679.0 feet			Noise 5	Source Heigh	ť: 8.0	feet
Barrier Distance to Observer:	0.0 feet			<i>q</i> 0	server Heigh	ť: 5.0	feet
Ohserver Flevation	0.0 feet		Barı	rier Type (0-	Wall, 1-Berm): 0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficien	ł: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doub 4.5 dBA per dou	ling of distanc ubling of distar	e Joe
	NOISE	MODEL PF	ROJECTIO	NS			
Noise Level	Distance (feet)	bəŢ	L50	L25	78	L2	Lmax
(seference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.
Distance Attenuation	12,679.0	-52.5	-52.5	-52.5	-52.5	-52.5	-52.
shielding (Barrier Attenuation)	12,679.0	0.0	0.0	0.0	0.0	0.0	0
kaw (Distance + Barrier)		14.7	-52.5	-52.5	-52.5	-52.5	-52.
30 Minute Hourly Adjustmen		14.7	-52.5	-52.5	-52.5	-52.5	-52
Observer Location: R7 Source: RC2 Condition: Cumulati	<i>ie</i> Developments		Project N Job Nu Ar	Jame: Knox mber: 9349 alyst: A. Wc	Business Pa olfe	논	
	ON	ISE MODEI	L INPUTS				
Noise Distance to Observer	1.963.0 feet			ä	arrier Heigh	t: 0.0	feet
Noise Distance to Barrier	1 963 0 feet			Noise S	Source Heiah	t: 8.0	feet
Barrier Distance to Observer:	0.0 feet			<i>q</i> 0	server Heigh	ť: 5.0	feet
Observer Elevation:	0.0 feet		Barı	rier Type (0-	Wall, 1-Berm): 0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficien	ł: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doub 4.5 dBA per dou	ling of distanc ubling of distar	e Jce
	NOISE	MODEL PF	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	L50	L25	87	L2	Lmax
keference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	1,963.0	-36.3	-36.3	-36.3	-36.3	-36.3	-36.
shielding (Barrier Attenuation)	1,963.0	0.0	0.0	0.0	0.0	0.0	0.0
kaw (Distance + Barrier)		30.9	-36.3	-36.3	-36.3	-36.3	-36.

Source: RC13 Condition: Cumulative D Noise Distance to Observer 8,8 Noise Distance to Barrier: 8,8			Project I	Vame: Knox	Business Park		
Condition: Cumulative C Noise Distance to Observer 8,8 Noise Distance to Barrier: 8,8			Job Nu	mber: 9349			
Noise Distance to Observer 8,8 Noise Distance to Barrier: 8,8	Jevelopments		Ar	nalyst: A. Wo	olfe		
Noise Distance to Observer 8,8 Noise Distance to Barrier: 8,8	ION	SE MODEL	- INPUTS				
Noise Distance to Barrier: 8,8	313.0 feet			B	arrier Height:	0.0	feet
	313.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of distar	e Ge
	NOISE	MODEL PF	ROJECTIO	SN			
Noise Level Dis.	stance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0
Distance Attenuation	88130	-49.4	-49.4	-49.4	-49.4	-49.4	-49
Shielding (Barrier Attenuation)	8.813.0	0.0	0.0	0.0	0.0	0.0	ġ
Raw (Distance + Barrier)		17.8	-49.4	-49.4	-49.4	-49.4	-49
Naw (Distance + Danier)		0.71	t.0 †	1.01-	t. 0†	1.01-	
60 Minute Hourly Adjustment		17.8	-49.4	-49.4	-49.4	-49.4	-49.
Observer Location: R7 Source: RC15			Project I Job Nu	Vame: Knox mber: 9349	Business Park		
Condition: Cumulative D	Jevelopments		Ar	nalyst: A. Wo	olfe		
		E MODEL					
		se model		1			
Noise Distance to Ubserver 7,4	133.0 teet			α, `	arrier Height:	0.0	feet
Noise Distance to Barrier: 7,4	133.0 feet			Noise S	source Height:	8.0	teet
Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Observer Flevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Flevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of distar	e
	NOISE	MODEL PF	SOJECTIO	SN			
Noise Level Dis	stance (feet)	Leq	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	O
Distance Attenuation	7,433.0	-47.9	-47.9	-47.9	-47.9	-47.9	-47.
Shielding (Barrier Attenuation)	7,433.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		19.3	-47.9	-47.9	-47.9	-47.9	-47.
60 Minute Hourly Adjustment		19.3	-47.9	-47.9	-47.9	-47.9	-47

Observer Location: R7 Source: P20 Condition: Cumulativ Noise Distance to Observer							
Source: P20 Condition: Cumulativ Noise Distance to Observer			Project I	Vame: Knox	Business Pa	ž	
Vonarion: Cumulativ			Job Nu	mber: 9349	- 16 -		
Noise Distance to Observer	e Developments		AI	naryst: A. Wi	olre		
Noise Distance to Observer	ION	SE MODE	L INPUTS				
Moise Distance to Dorrior.	5,965.0 feet			-	arrier Height	:: 0:0	feet
NOISE DISTATICE IN DALITEL.	5,965.0 feet			Noise	Source Heigh	ť: 8.0	feet
Barrier Distance to Observer:	0.0 feet			Ob	server Heigh	ť: 5.0	feet
Ohservar Flavation.	0 0 feet		Bar	rier Type (0-	Wall, 1-Berm	:(
Noise Source Flevation	0.0 feet			Drop	Off Coefficien	ť: 20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	: 6 dBA per doub : 4.5 dBA per dou	ling of distanc	se nce
	NOISE	MODEL P	ROJECTIO	SNO			
Noise Level L	Distance (feet)	bəŢ	T50	L25	<i>L8</i>	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	5,965.0	-46.0	-46.0	-46.0	-46.0	-46.0	-46.
Shielding (Barrier Attenuation)	5,965.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		21.2	-46.0	-46.0	-46.0	-46.0	-46.
60 Minute Hourly Adjustment		с <u>к</u> с	0 31	0.31	16.0	10.04	1 3 1
Observer Location: R7			Project I	Vame: Knox	Business Pa	¥	
Source: RC12			un dol.	mber: 9349			
Condition: Cumulativ	e Developments		A	nalyst: A. Wi	olfe		
	ION	SE MODE	L INPUTS				
Noise Distance to Observer	4,262.0 feet			8	arrier Height	t: 0.0	feet
Noise Distance to Barrier:	4,262.0 feet			Noise :	Source Heigh	ť: 5.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Heigh	ť: 5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm): 0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficien	ť: 15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	: 6 dBA per doub : 4.5 dBA per dou	ling of distanc ubling of dista	se nce
	NOISE	MODEL P	ROJECTIO	SN			
Noise Level	Distance (feet)	bəŢ	T50	L25	R8	L2	Lmax
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	4,262.0	-44.0	-44.0	-44.0	-44.0	-44.0	-44.(
Shielding (Barrier Attenuation)	4,262.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		16.1	-44.0	-44.0	-44.0	-44.0	-44.(
60 Minute Hourly Adjustment		16.1	-44.0	-44.0	-44.0	-44.0	-44.

Condition: Cumulative			Li Ujecti	vame: Knox	t Business Park	~	
	Developments		JOD IVU Ar	imber: 9349 nalvst: A. Wo	olfe		
	ION	SE MODEL	INPUTS				
Noise Distance to Observer	3.300.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier: 3	3.300.0 feet			Noise 3	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ot	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc ling of dista	e
	NOISE	MODEL PR	ROJECTIO	SN			
Noise Level L	Distance (feet)	Leq	L50	125	87	L2	Lm
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	3,300.0	-40.8	-40.8	-40.8	-40.8	-40.8	'
Shielding (Barrier Attenuation)	3,300.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		26.4	-40.8	-40.8	-40.8	-40.8	'
60 Minute Hourly Adjustment		26.4	-40.8	-40.8	-40.8	-40.8	7
Observer Location: R8 Source: RC6			Project I Job Nu	Vame: Knox mber: 9349	Business Park	<u> </u>	
Source: RC6 Condition: Cumulative	Developments		Job Nu Ar	ımber: 9349 nalyst: A. Wı	olfe		
	ION	SE MODEL	. INPUTS				
Noise Distance to Observer	,140.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier: 1	140.0 feet			Noise 3	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Ot	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc ling of dista	e
	NOISE	MODEL PR	ROJECTIO	SN			
Noise Level	Distance (feet)	Leq	T50	L25	87	L2	Γw
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	11,140.0	-51.4	-51.4	-51.4	-51.4	-51.4	Ċ
Shielding (Barrier Attenuation)	11,140.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		15.8	-51.4	-51.4	-51.4	-51.4	
60 Minute Hourly Adjustment		15.8	-51.4	-51.4	-51.4	-51.4	'

Observer Location: RT Project Name: Kox Business Park Job Number: 33.49 Source: Fundative Developments Job Number: 33.49 Noise Distance to Diserver: 0.0 feet Barrier Height: Noise Distance to Diserver: Diserver Height: Diserver Levation: Noise Distance to Diserver: 0.0 feet Barrier Type (// Wall, 1-Berm): Diserver Elevation: Diserver Levation: Noise Distance to Diserver: 0.0 feet Barrier Type (// Wall, 1-Berm): Diserver Elevation: Diserver Levation: Noise Distance to Diserver: 0.0 feet Barrier Type (// Wall, 1-Berm): Diserver Elevation: Diserver Levation: Noise Level Distance (feer) Level Diserver Diserver Noise Level 35.90 -41.4 -41.4 - Noise Level Distance (feer) Left -41.4 - Noise Distance In Ourly Adjustment 35.8 -41.4 - - Stating (Barrier Elevation: 0.0 0.0 0.0 0.0 0.0 Reverte Levation: 3.50.91 -41.4 -1.4 - - Noise Distance to Barrier: 5.8 -41.4 -1.4 - Source: RC1 Distance to Barrier: 0.0 0.0 0.0 0.0 Reverter Levation: 0.0 0.0 <th>Observer Location: R7 Source: P47</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Observer Location: R7 Source: P47							
Source: PAT Dohlmber: 3639 Condition: Unsite Analys: Availys: Noise Distance to Observer: 3.503.0 feet Noise Distance to Observer: 3.503.0 feet Noise Distance to Observer: 3.503.0 feet Barrier Height: Noise Distance to Observer: 0.0 feet Dosenver Height: Noise Distance (feet) 1.44 41.4 -1.4 Noise Level Distance (feet) 2.5.8 -41.4 -1.4 Noise Distance Height: Distance Memory 3.503.0 -41.4 -1.4 Noise Distance Surper Height: Noise Distance Memory 3.503.0 -41.4 -1.4 Noise Distance Memory 3.503.0 -41.4 -41.4 -1.4 Noise Distance Memory 3.503.0 -41.4 -1.4 -1.4 Noise Distance Memory 3.503.0 -41.4 -1.4 -1.4 Molise Distance Memory 3.503.0 -41.4 -1.4 -1.4 Barrier M	Source: P47			Project I	Vame: Knox	Business Park		
Condition:: Cumulative Developments Analyst: A. Wolfe Noise Distance to Observer: S.03.0.0 feet Molse Source Height: Noise Distance to Observer: 0.0 feet Observer Height: Observer Elevation: 0.0 feet Distance (feet) L23 Noise Source Elevation: 0.0 feet Distance (feet) L2 Noise Level Distance (feet) Lag L2 Noise Level Distance (feet) L30 0.0 0.0 Noise Level Distance (feet) L20 L25 L8 L2 Noise Level Distance (feet) L30 L3 L4 -41.4 - Shelding (Barrier Attenuation) 3.503.0 -41.4 -41.4 -41.4 - Shelding (Barrier Meation 3.503.0 -41.4 -41.4 - - Shelding (Barrier Attenuation) 3.503.0 -41.4 -41.4 - - Shelding (Barrier Attenuation) S.503.0 -41.4 -41.4 - - Shelding (Barrier Attenuation) Sourc				Job Nu	mber: 9349	:		
NOISE MODEL INPUTS Noise Distance to Observer 3.503.0 feet Mole Bistance to Barrier 7, 303.0 feet Barrier Height: Observer Flevation: Dose Source Height: Observer Flevation: Dose Source Height: Observer Flevation: Dose Source Height: Dose Source Elevation: Dose Source Height: Observer Height: Distance Attenuation Distance (feet) Q Distance Attenuation Distance Attenuation <thdistance attenuation<="" th=""> <thdistance< th=""><th></th><th>ive Developments</th><th></th><th>AI</th><th><i>alyst:</i> A. Wo</th><th>olfe</th><th></th><th></th></thdistance<></thdistance>		ive Developments		AI	<i>alyst:</i> A. Wo	olfe		
Noise Distance to Observer 3,503.0 feet Barrier Height: Observer Elevation: 0.0 feet Barrier Height: Observer Height: 00server Elevation: 0.0 feet Barrier Type (0.Wall, 1-Bern): 00server Elevation: 0.0 feet Barrier Type (0.Wall, 1-Bern): 00server Elevation: 0.0 feet Barrier Type (0.Wall, 1-Bern): 00server Elevation: 0.0 feet Concernentiation: 0.0 feet Noise Distance to Observer: 0.0 feet 0.0 feet 0.0 feet 0.0 0.0 0.0 Noise Level Distance Attenuation 3.509.0 e41.4 -41.4 - - Shielding (Barrier Attenuation) 3.509.0 e41.4 -41.4 - - Reference Samole Source: RCI Distance Plane: - - - Reference Samole Source: RCI Distance Plane: - - - Reference Samole Source: RCI Distance Plane: - - - Reference Samole Source: RCI Distance Plane: Distance Plane: -		ION	ISE MODEL	. INPUTS				
Noise Distance to Barrier: 3,509.0 feet Noise Distance to Diserver: 0.0 feet Noise Source Flevation:: 0.0 feet Noise Source Flevation:: 0.0 feet Barrier Distance to Observer: 0.0 feet 0.0 feet Barrier Type (O.Wall, 1.4Barr) Noise Source Elevation:: 0.0 feet 0.0 feet 25.e eff8A per doubling Noise Source Elevation:: 0.0 feet 0.0 feet 1.25 1.28 Noise Level Distance flevel() 67.2 0.0 0.0 0.0 Noise Level 3,509.0 -41.4 -1.4 -1.4 Noise Level 0 Noise Neurose Neuro	Noise Distance to Observer	3,509.0 feet			ä	arrier Height:	0.0	feet
Barrier Distance to Observer: 0.0 feet Observer Height: Drop Off Coefficient: Drop Off Coefficient: Observer Height: Prop off Coefficient: Noise Source Elevation:: 0.0 feet Barrier Type (0.Mail, 1-Berrn): Drop Off Coefficient: Noise Source Elevation:: 0.0 feet Barrier Type (0.Mail, 1-Berrn): Noise Source Elevation:: 0.0 feet 20-e 6da per doubing (15-e 45 da per doubing) Moise Level Distance Attenuation 3,509.0 -41.4 -1.4 Noise Level Distance (14,4,41,4,41,4,41,4,41,4,41,4,41,4,41,	Noise Distance to Barrier:	3,509.0 feet			Noise S	source Height:	8.0	feet
Observer Elevation: 0.0 feet Barrier Type (O.Mail, 1-Berm): Noise Source Elevation: 0.0 feet 2 = 6 dBA per doubing of 15 = 45 dBA per doubing dBarrier Distance to Diserver: Observer Source: RC1 Source: RC1 Source: RC1 Source: RC1 Source: RC1 Source fBA per doubing of 15 = 45 dBA per doubing (Barrier Attenuerion:	Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Noise Source Elevation: 0.01 feet Drop Off Coefficient: Barrier Elevation: 0.01 feet 2.6 dBA per doubling Noise Source Elevation: 0.01 feet 2.6 dBA per doubling Noise Level Distance (feet) Leq L25 L8 -1.2 Noise Level Distance (feet) Leq L35 L35 L41 -1.4 Shelding (Barrier Attenuation) 3.509.0 0.0	Observer Flevation	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Barrier Elevation: 0.01 feet Provise Level Distance (eed) Loc 0.00 Reference (Sample) 30.0 67.2 0.0 0.0 0.0 Distance Alteruation) 3.509.0 -41.4 -41.4 -1.4 Shelding (Barrier Alternation) 3.509.0 -41.4 -41.4 -1.4 Condition: RT 25.8 -41.4 -41.4 -1.4 Source: RCI 20.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 25.8 -41.4 -41.4 -1.4 -1.4 Source: RCI 20.0 0.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier Moles Distance to Observer 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0<	Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Noise Level Noise Mobel PROJECTIONS Noise Level Distance (feer) Leq L50 L25 L8 L2 Distance Attenuation 3.0.0 67.2 0.0 0.0 0.0 0.0 Distance Attenuation 3.509.0 -41.4 -41.4 -41.4 -41.4 - Shelding (Barrier Attenuation) 3.509.0 -41.4 -41.4 -41.4 - Raw (Distance Harrier) 3.509.0 -41.4 -41.4 -41.4 - Stance Attenuation 3.509.0 -41.4 -41.4 -41.4 - Raw (Distance Hourly Adjustment 25.8 -41.4 -41.4 - - Sources RC1 3.500.0 0.0 0.0 0.0 0.0 0.0 Distance to Barrier IS Analyst: A. Wolfe Analyst: A. Wolfe - - - Noise Distance to Dbserver 67.0 feet Dob Number: 9349 Dobserver Height: - - - - - - - - - -<	Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of dista	e nce
Noise LevelDistance (feet)LeqL50L25L8L2Reference (Sample)3.509.0 67.2 0.00.00.0Distance Attenuation3.509.0 -41.4 -41.4 -41.4 -41.4 -41.4 Shelding (Barrier Attenuation)3.509.0 -41.4 -41.4 -41.4 -41.4 -41.4 Raw (Distance Harrier)3.509.0 0.0 0.0 0.0 0.0 0.0 Raw (Distance Harrier)3.509.0 -41.4 -41.4 -41.4 -41.4 -41.4 Raw (Distance Harrier) 25.8 -41.4 -41.4 -41.4 -41.4 Static Ray (Distance Harrier) 25.8 -41.4 -41.4 -41.4 -41.4 Static Ray (Distance Floritier Ray (Distance Harrier Ray (Distance Harrier Ray (Distance Height: Distance to Distance to Distance to Barrier 0.0 0.0 0.0 Noise Distance to Distance to Distance to Barrier 0.0 0.0 0.0 0.0 0.0 Noise Distance to Distance to Distance to Barrier 0.0 0.0 0.0 0.0 Noise Distance to Distance to Barrier 0.0 0.0 0.0 0.0 Noise Distance to Distance to Barrier 0.0 0.0 0.0 0.0 Distance to Barrier Revation: 0.0 0.0 0.0 0.0 Noise Distance to Barrier Revation: 0.0 0.0 0.0 0.0 Distance te Distance to Barrier Revation: 0.0 0.0 0.0 0.0 Distance te levat		NOISE	MODEL PR	OJECTIO	SNO			
Reference (Sample) 30.0 67.2 0.0 0.0 0.0 Distance Attenuation 3,509.0 -41.4 -41.	Noise Level	Distance (feet)	Leq	L50	L25	78	L2	Lme
Distance Attenuation 3,509,0 -41,4 -41,4 -41,4 -1,4 Raw (Distance + Barrier) 3,509,0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 3,509,0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 3,509,0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 25,8 -41,4 -41,4 -41,4 -41,4 Stationary Adjustment 25,8 -41,4	Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Shielding (Barrier Attenuation) 3,509,0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 25.8 -41.4 -41.4 -1.4 <t< td=""><td>Distance Attenuation</td><td>3,509.0</td><td>-41.4</td><td>-41.4</td><td>-41.4</td><td>-41.4</td><td>-41.4</td><td>7</td></t<>	Distance Attenuation	3,509.0	-41.4	-41.4	-41.4	-41.4	-41.4	7
Raw (Distance + Barrier) 25.8 -41.4 -41.4 -41.4 60 Minute Hourly Adjustment 25.8 -41.4 -41.4 -41.4 S0 Minute Hourly Adjustment 25.8 -41.4 -41.4 -41.4 -41.4 S0 Minute Hourly Adjustment 25.8 -41.4 -41.4 -41.4 -41.4 S0 Minute Hourly Adjustment 25.8 -41.4 -41.4 -41.4 -41.4 S0 Minute Hourly Adjustment 25.8 -41.4 -41.4 -41.4 -41.4 -41.4 Observer Location: RT Source: RC1 Monise Distance Notion Monise Distance Height: Noise Distance to Diserver G0 Noise Distance Notion Monise Distance Notion Monise Distance Height: Noise Distance to Diserver G0 Earlier Type (0-Wall, 1-Berm): Drop Off Coefficient: Drop Off Coefficient: Noise Distance to Diserver G0 Earlier Type (0-Wall, 1-Berm): Drop Off Coefficient: Drop Off Coefficient: Distance Elevation: 0.0 Earlier Typ	Shielding (Barrier Attenuation)	3,509.0	0.0	0.0	0.0	0.0	0.0	
60 Minute Hourly Adjustment 25.8 -41.4 -41.4 -41.4 SIATIONARY SOURCE NOISE PREDICTION MODEL STATIONARY SOURCE NOISE PREDICTION MODEL Observer Location: RT Project Name: Knox Business Park Source: RC1 Obs Number: 9349 -41.4 -41.4 Observer Location: RT Source: RC1 Job Number: 9349 -0.0 Number: 9349 Source: RC1 Job Number: 9349 -0.0 Number: 9349 Source: RC1 Monse Distance to Observer 67.0 feet Noise Distance to Barrier Type (0-Wall, 1-Berm): Noise Distance to Observer 0.0 feet Barrier Type (0-Wall, 1-Berm): Dop Off Coefficient: Noise Distance to Observer 0.0 feet 2.9 = 6BA per doubling of 15 = 4.5 dBA per doubling of 15 = 4.5	Raw (Distance + Barrier)		25.8	-41.4	-41.4	-41.4	-41.4	7
STATIONARY SOURCE NOISE PREDICTION MODEL STATIONARY SOURCE NOISE PREDICTION MODEL Observer Location: RT Project Name: Knox Business Park Job Number: 9349 Source: RC1 Dob Number: 9349 Source: RC1 Job Number: 9349 Source: RC1 Job Number: 9349 Source: RC1 Analyst: A. Wolfe Moise Distance to Observer 67.0 feet Noise Distance to Observer 0.0 feet Noise Distance to Observer 0.0 feet Noise Distance to Observer Barrier Type (0-Wall, 1-Berm): Dob Off Coefficient: Noise Distance to Observer 0.0 feet Noise Source Elevation: 0.0 feet Noise Source Elevation: 0.0 feet Noise Levation: 0.0 feet Noise Level Distance (feet) Interference (Sample) 67.0 Obstance Heartich 60.2 Reference (Sample) 67.0 Ostance Heartich 0.0 Reference (Sample) 60.2 Statue Attenuation 67.0 Statue Attenuation 67.0 Obstance Heartiel 60.2 Statue 0.0 Obstance Heartiel 0.0 Noise Source Sampe	60 Minute Hourly Adjustmen	t	25.8	-41.4	-41.4	-41.4	-41.4	1
Source: RC1 Job Number: 9349 Condition: Lumber: Markst: Analyst: A. Wolfe Noise Distance to Diserver 67.0 feet Den Barrier Height: Noise Distance to Diserver: 0.0 feet Barrier Type (0-Wall, 1-Berm): Noise Distance to Diserver: 0.0 feet Diserver Height: Noise Distance to Diserver: 0.0 feet Diserver Height: Noise Source Elevation: 0.0 feet Diserver Image: Diserver Height: Noise Source Elevation: 0.0 feet Diserver Image: Diserver Height: Noise Source Elevation: 0.0 feet Diserver Image: Diserver Height: Noise Source Elevation: 0.0 feet Diserver Image: Diserver Image: Diserver Image: Diserver Image: Moise Source Elevation: 0.0 feet Loo Diserver Image: Diserver Image: Diserver Image: Diserver Image: Moise Level Distance (feet) Leq Loo O.0 <	Observer Location: R7			Project I	Vame: Knox	Business Park		
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Source: RC1			Job Nu	mber: 9349			
NOISE MODEL INPUTS Noise Distance to Observer 67.0 feet Barrier Height: Noise Distance to Darrier: 67.0 feet Noise Source Height: Daserver Elevation: 0.0 feet Observer Height: Noise Source Elevation: 0.0 feet Daserver Height: Noise Source Elevation: 0.0 feet 2.3 e. 6BA per doubling of 15. e. 4.5 dBA per dou	Condition: Cumulat	ive Developments		A	nalyst: A. Wo	olfe		
Noise Distance to Observer 67.0 feet Barrier Height: Noise Distance to Barrier: 67.0 feet Barrier Height: Noise Distance to Observer: 0.0 feet Observer Height: Distance to Observer: 0.0 feet Observer Height: Observer Elevation: 0.0 feet Dop Off Coefficient: Noise Source Elevation: 0.0 feet Dop Off Coefficient: Noise Source Elevation: 0.0 feet 2.5 e.6BA per doubling of 15 = 4.5 dBA per doubling of 15		ION	ISE MODEL	. INPUTS				
Noise Distance to Barrier:67.0 feetNoise Source Height: Observer:Barrier Distance to Observer:0.0 feetObserver Height: Observer Height:Observer Elevation:0.0 feetDeaminer Distance (Deaminer) Distance to Elevation:Moise Source Elevation:0.0 feet 20.6 efaA per doubling of 15 = 45 dBA per doubling of 16 = 45 dBA per	Noise Distance to Observer	67.0 feet			ä	arrier Height:	0.0	feet
Barrier Distance to Observer: 0.0 feet Observer Height: Observer Elevation: 0.0 feet Barrier Type (0-Wall, 1-Berm): Noise Source Elevation: 0.0 feet Drop Off Coefficient: Noise Source Elevation: 0.0 feet 20 = 6 dBA per doubling of 15 = 4.5 dBA per doubling of 12 = 4.5 dB	Noise Distance to Barrier:	67.0 feet			Noise S	source Height:	8.0	feet
Observer Elevation: 0.0 feet Barrier Type (0-Wall, 1-Berm): Drop Off Coefficient: Noise Source Elevation: 0.0 feet 20.6 edA per doubing of 15.6 4.5 dBA per doubing 15.6	Barrier Distance to Observer:	0.0 feet			90	server Height:	5.0	feet
Noise Source Elevation: 0.0 feet Drop Off Coefficient: Barrier Elevation: 0.0 feet 21 = 6 dBA per doubling of 15 = 4.5 dBA per doubling of 12 = 4.5 dB	Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Barrier Elevation: 0.0 feet 22 = 6 dA per doubling of 15 = 4.5 dBA per doubling of 12 = 4.5 dBA per doub	Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
NOISE MODEL PROJECTIONS Noise Level Distance (feet) Leq L50 L8 L2 Reference (Sample) 30.0 67.2 0.0 0.0 0.0 Distance Attenuation 67.0 -7.0 -7.0 7.0 7.0 Shielding (Barrier Attenuation) 67.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 60.2 -7.0 -7.0 -7.0 -7.0	Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	g of distanc ing of dista	e nce
Noise Level Distance (feet) Leq L50 L25 L8 L2 Reference (Sample) 30.0 67.2 0.0 0.0 0.0 Distance Attenuation 67.0 -7.0 -7.0 -7.0 -7.0 Shielding (Barrier Attenuation) 67.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 60.2 -7.0 -7.0 -7.0 -7.0		NOISE	MODEL PR	OJECTIO	SNO			
Reference (Sample) 30.0 67.2 0.0 0.0 0.0 Distance Attenuation 67.0 -7.0 <	Noise Level	Distance (feet)	Leq	T50	L25	78	L2	Lme
Distance Attenuation 67.0 -7.0 -7.0 -7.0 -7.0 -7.0 Shielding (Barrier Attenuation) 67.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 60.2 -7.0 -7.0 -7.0	Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Shielding (Barrier Attenuation) 67.0 0.0 0.0 0.0 0.0 Raw (Distance + Barrier) 60.2 -7.0 -7.0 -7.0	Distance Attenuation	67.0	-7.0	-7.0	-7.0	-7.0	-7.0	
Raw (Distance + Barrier) 60.2 -7.0 -7.0	Shielding (Barrier Attenuation)	67.0	0.0	0.0	0.0	0.0	0.0	
	Raw (Distance + Barrier)		60.2	-7.0	-7.0	-7.0	-7.0	
60 Minute Hourly Adjustment 60.2 -7.0 -7.0 -7.0	60 Minute Hourly Adjustmer	ıt	60.2	-7.0	-7.0	0 2-	0 2-	

Condition: Cumulati			In dol.	mher: 9349			
	ve Developments		A	nalyst: A. W	olfe		
	ON	ISE MODEI	- INPUTS				
Noise Distance to Observer	9,453.0 feet			8	sarrier Height:	0.0	feet
Noise Distance to Barrier: Barrier Distance to Observer	9,453.0 feet 0.0 feet			Noise . Ob	Source Height: server Height:	8.0 5.0	feet feet
	200		ſ	, 			
Observer Elevation:	0.0 feet		Bar	Ther Lype (U- Drop	-Wall, 1-Berm): Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distanc ling of dista	se Dice
	NOISE	MODEL PF	SOJECTIO	SNO			
Noise Level	Distance (feet)	Leq	L50	125	87	L2	Lma.
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	9,453.0	-50.0	-50.0	-50.0	-50.0	-50.0	Ÿ
Shielding (Barrier Attenuation)	9,453.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		17.2	-50.0	-50.0	-50.0	-50.0	Ŷ
60 Minute Hourly Adjustment	_	17.2	-50.0	-50.0	-50.0	-50.0	Ÿ
Observer Location: R8 Source: P20			Project I Job Nu	Vame: Knox imber: 9349	t Business Park	Č.	
Condition: Cumulativ	ve Developments		A	nalyst: A. W	olfe		
	NO	ISE MODEL	- INPUTS				
Noise Distance to Observer	6,552.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier:	6,552.0 feet			Noise :	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			Of	oserver Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	-Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	= 6 dBA per doublir = 4.5 dBA per doub	ng of distand ling of dista	se nce
	NOISE	MODEL PF	SOJECTIO	SN			
Noise Level	Distance (feet)	req	L50	L25	R8	L2	Lme
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	6,552.0	-46.8	-46.8	-46.8	-46.8	-46.8	1
Shielding (Barrier Attenuation)	6,552.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		20.4	-46.8	-46.8	-46.8	-46.8	1

			Project N	lame: Knox	Business Par	×	
Source: RC2 Condition: Cumulati	e Developments		Job Nu An	mber: 9349 alyst: A. Wo	olfe		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	218.0 feet			ä	arrier Height.	.0.0	feet
Noise Distance to Barrier:	218.0 feet			Noise S	source Height	: 8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height	: 5.0	feet
Observer Elevation:	0.0 feet		Barı	ier Type (0-	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dou	ng of distanc bling of distar	900
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	bəŢ	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ő
Distance Attenuation	218.0	-17.2	-17.2	-17.2	-17.2	-17.2	-17
Shielding (Barrier Attenuation)	218.0	0.0	0.0	0.0	0.0	0.0	Ő
Raw (Distance + Barrier)		50.0	-17.2	-17.2	-17.2	-17.2	-17
60 Minute Hourly Adjustment		50.0	-17.2	-17.2	-17.2	-17.2	-17
Observer Location: R8			Project N	lame: Knox	Business Par	×	
Source: P13			Job Nu	mber: 9349			
Condition: Cumulati	e Developments		An	<i>ialyst:</i> A. Wo	olfe		
	ION	ISE MODE	L INPUTS				
Noise Distance to Observer	2,773.0 feet			ä	arrier Height.	. 0.0	feet
Noise Distance to Barrier:	2,773.0 feet			Noise S	source Height	: 8.0	feet
Barrier Distance to Observer:	0.0 feet			90	server Height	. 5.0	feet
Observer Elevation:	0.0 feet		Barı	ier Type (0-	Wall, 1-Berm)	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubli 4.5 dBA per dou	ng of distanc bling of distar	e Joe
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	Leq	T50	L25	F 8	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ó
Distance Attenuation	2,773.0	-39.3	-39.3	-39.3	-39.3	-39.3	-39
Shielding (Barrier Attenuation)	2,773.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		27.9	-39.3	-39.3	-39.3	-39.3	-39

Source: RC15 Condition: Cumulative I Noise Distance to Observer 9;				10000			
Condition: Cumulative I Noise Distance to Observer 9;			NN QOL	mber: 9349			
Noise Distance to Observer 9,:	Developments		Ar	nalyst: A. Wo	olfe		
Noise Distance to Observer 9,	ION	SE MODE	L INPUTS				
	327.0 feet			8	arrier Height:	0.0	feet
Noise Distance to Barrier: 9,	327.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Ohsenver Flevation	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop	Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	:6 dBA per doublin : 4.5 dBA per doubl	ig of distanc ling of distar	e
	NOISE	MODEL PI	ROJECTIO	SN			
Noise Level Dis	tance (feet)	Leq	L50	125	87	L2	Lmá
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	9,327.0	-49.9	-49.9	-49.9	-49.9	-49.9	'
Shielding (Barrier Attenuation)	9,327.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		17.3	-49.9	-49.9	-49.9	-49.9	ĩ
60 Minute Hourly Adjustment		17.3	-49.9	-49.9	-49.9	-49.9	1
Observer Location: R8 Source: P47			Project I Job Nu	Vame: Knox mber: 9349	Business Park		
Condition: Cumulative I	Developments		Ar	nalyst: A. Wo	olfe		
	ION	SE MODE	L INPUTS				
Noise Distance to Observer 2,	60.0 feet			B	arrier Height:	0.0	feet
Noise Distance to Barrier: 2,	160.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qo	server Height:	5.0	feet
Observer Elevation:	0.0 feet		Bar	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation:	0.0 feet			Drop (Off Coefficient:	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doublin 4.5 dBA per doubl	ig of distanc ling of distar	e
	NOISE	MODEL PI	ROJECTIO	SN			
Noise Level Dis	tance (feet)	Leq	L50	L25	87	<i>L2</i>	Γm
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	
Distance Attenuation	2,160.0	-37.1	-37.1	-37.1	-37.1	-37.1	
Shielding (Barrier Attenuation)	2,160.0	0.0	0.0	0.0	0.0	0.0	
Raw (Distance + Barrier)		30.1	-37.1	-37.1	-37.1	-37.1	
60 Minute Hourly Adjustment		30.1	-37 1	-37.1	-37.1	- 37 4	'

			Project N	Jame: Knox	Business Par	¥	
Source: RC12			Job Nu	mber: 9349			
Condition: Cumulati	ve Developments		An	alyst: A. Wc	lfe		
	ION	SE MODE	INPUTS				
Noise Distance to Observer	5,495.0 feet			ä	arrier Height	: 0.0	feet
Noise Distance to Barrier:	5,495.0 feet			Noise S	source Heigh	5.0	feet
Barrier Distance to Observer:	0.0 feet			'qO	server Height	5.0	feet
Ohserver Flevation	0.0 feet		Barı	rier Type (0-I	Wall, 1-Berm,	0	
Noise Source Flevation	0.0 feet			Drop (Off Coefficien	t: 15.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubl 4.5 dBA per dou	ing of distanc bling of distar	e Joe
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	req	L50	L25	78	L2	Lmax
Reference (Sample)	5.0	60.1	0.0	0.0	0.0	0.0	0
Distance Attenuation	5,495.0	-45.6	-45.6	-45.6	-45.6	-45.6	-45.
Shielding (Barrier Attenuation)	5,495.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		14.5	-45.6	-45.6	-45.6	-45.6	-45.
60 Minute Hourly Adjustmen	_	14.5	-45.6	-45.6	-45.6	-45.6	-45
Observer Location: R8 Source: RC13 Condition: Cumulati	ve Developments		Project N Job Nu An	<i>Jame:</i> Knox <i>mber:</i> 9349 <i>alyst:</i> A. Wc	Business Pau life	×	
	ION	SE MODE	INPUTS				
Noise Distance to Observer	9,950.0 feet			ä	arrier Height	. 0.0	feet
Noise Distance to Barrier:	9,950.0 feet			Noise S	ource Heigh	8.0	feet
Barrier Distance to Observer:	0.0 feet			â	server Heign	0.0	Teet
Observer Elevation:	0.0 feet		Bari	rier Type (0-I	Wall, 1-Berm,	0	
Noise Source Elevation:	0.0 feet			Drop (011 Coetticien	20.0	
Barrier Elevation:	0.0 feet			20 = 15 =	6 dBA per doubl 4.5 dBA per dou	ing of distanc bling of distar	е Јое
	NOISE	MODEL P	ROJECTIO	NS			
Noise Level	Distance (feet)	bəŢ	L50	L25	87	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	Ö
Distance Attenuation	9,950.0	-50.4	-50.4	-50.4	-50.4	-50.4	-20
Shielding (Barrier Attenuation)	9,950.0	0.0	0.0	0.0	0.0	0.0	Ö
Raw (Distance + Barrier)		16.8	-50.4	-50.4	-50.4	-50.4	-20

	STATIONARY SC	URCE NOIS	יב אל בטוט				
Observer Location: R8			Project N	Vame: Knox	Business Park		
Source: RC22			Job Nu.	mber: 9349			
Condition: Cumulat	tive Developments		An	alyst: A. Wo	olfe		
	ION	ISE MODEL	. INPUTS				
Noise Distance to Observer	2,803.0 feet			á	arrier Height:	0.0	feet
Noise Distance to Barrier:	2,803.0 feet			Noise S	Source Height:	8.0	feet
Barrier Distance to Observer:	0.0 feet			qO	server Height:	5.0	feet
Ohserver Flevation	. 00 faat		Barı	rier Type (0-	Wall, 1-Berm):	0	
Noise Source Elevation	· 0.0 foot			Drop (Off Coefficient:	20.0	
Rarrier Flevation	· 0.0 feet			20 =	6 dBA per doublin	g of distance	¢,
				15 =	4.5 dBA per doubl	ling of distar	Ce
	NOISE	MODEL PF	SOJECTIO	NS			
Noise Level	Distance (feet)	req	L50	L25	78	L2	Lmax
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	2,803.0	-39.4	-39.4	-39.4	-39.4	-39.4	-39.4
Shielding (Barrier Attenuation)	2,803.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		27.8	-39.4	-39.4	-39.4	-39.4	-39.4
60 Minute Hourly Adjustmer	H.	27.8	-39.4	-39.4	-39.4	-39.4	-39.4

APPENDIX 10.1:

CONSTRUCTION REFERENCE NOISE LEVEL MEASUREMENTS MEMO







SUBJECT: CONSTRUCTION REFERENCE NOISE LEVEL MEASUREMENTS MEMO

This Construction Reference Noise Level Measurements Memo has been prepared to summarize the sample reference noise level measurements collected by Urban Crossroads, Inc. To describe peak construction noise activities, we have historically relied on reference noise level measurements provided in the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM). However, our experience demonstrates that the RCNM significantly overstates the predicted construction noise levels. This is largely due the fact that RCNM is based on construction equipment data collected from the Central Artery/Tunnel project in Boston, Massachusetts in the early 1990's. Due to substantial changes in the air quality emission requirements in the State of California Air Resources Board (ARB), the RCNM reference noise level measurements do not adequately describe modern construction equipment noise levels. In addition, the RCNM methodology places all construction equipment at a single point near the property line. This scenario simply does not occur in the real world as typical construction activity represents a variety of equipment operating at different locations throughout the project site.

REFERENCE NOISE LEVEL MEASUREMENTS

To estimate a project's construction-related noise levels, sample reference noise level measurements of similar construction activities were collected by Urban Crossroads, Inc. to describe the different stages of construction. The reference noise levels are intended to represent typical construction noise levels when multiple pieces of equipment are operating simultaneously at a construction site. The following reference noise level measurements were collected from existing construction operations with similar equipment as those expected with future construction of comparable land uses. Appendix A includes the data collected from each of the reference noise level measurements adjusted to present noise levels at a uniform reference distance of 50 feet. Appendix B includes the reference noise source photos by identification number ("ID"). Table 1 summarizes the reference noise level measurements. The reference noise level measurements are identified by land use type and location below.

BUSINESS PARK CONSTRUCTION SITE, CITY OF IRVINE

On Wednesday, October 14th, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine. The reference noise level measurements include the following noise source activities: a truck pass-by and background dozer activity (ID 1) and dozer activity (ID 2). Both measurements were taken at a distance of approximately 30 feet from the source and represent typical construction activities during the grading stage of construction.

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RESIDENTIAL CONSTRUCTION SITE, CITY OF RANCHO MISSION VIEJO

On Tuesday, October 20th, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements at a residential construction site located in the unincorporated area within the County of Orange known as Rancho Mission Viejo. The reference noise level measurements include the following noise source activities: construction vehicle maintenance (ID 3), foundation trenching (ID 4), rough grading activities (ID 5), and residential building framing (ID 6). All reference measurements were taken at this location at a distance of approximately 30 feet from the noise source.

INDUSTRIAL SITE, CITY OF ONTARIO

Additional short-term reference noise level measurements were collected on Friday, October 30th, 2015, by Urban Crossroads, Inc. at an active industrial construction site in the City of Ontario. The reference noise level measurements represent the grading activities associated with industrial/warehousing construction. Five reference noise level measurements were taken at this location to describe: a water truck pass-by and backup alarm (ID 7), a dozer pass-by (ID 8), two scrapers and a water truck pass-by (ID 9), two scrapers pass-by (ID 10), and scraper, water truck and dozer activities over a 30-minute period (ID 11). All reference measurements taken at this location were at a distance of approximately 30 feet from the source.

INDUSTRIAL SITE, CITY OF REDLANDS

On July 1st, 2015, Urban Crossroads, Inc. collected short-term construction noise level measurements of a nighttime concrete pour at an industrial construction site located at 27334 San Bernardino Avenue in the City of Redlands. The reference noise level measurements include the following nighttime building construction and paving-related noise source activities: concrete mixer truck movements (ID 12), concrete paver activities (ID 13), concrete mixer pour & paving activities (ID 14), concrete mixer backup alarms and air brakes (ID 15), and a one-hour measurement over the duration of all reference measurements at this location of concrete mixer pour activities (ID 16).



ID	Noise Source	Reference Distance From Source	Refe Noise @ Referen	rence Levels ce Distance	Refer Noise @ 50	rence Levels Feet ⁶
		(Feet)	dBA Leq	dBA Lmax	dBA Leq	dBA Lmax
1	Truck Pass-Bys & Dozer Activity ¹	30'	63.6	68.1	59.2	63.7
2	Dozer Activity ¹	30'	68.6	76.4	64.2	72.0
3	Construction Vehicle Maintenance Activities ²	30'	71.9	74.8	67.5	70.4
4	Foundation Trenching ²	30'	72.6	74.9	68.2	70.5
5	Rough Grading Activities ²	30'	77.9	84.8	73.5	80.4
6	Residential Framing ³	30'	66.7	76.7	62.3	72.3
7	Water Truck Pass-By & Backup Alarm ⁴	30'	76.3	82.3	71.9	77.9
8	Dozer Pass-By ⁴	30'	84.0	89.9	79.6	85.5
9	Two Scrapers & Water Truck Pass-By ⁴	30'	83.4	89.0	79.0	84.6
10	Two Scrapers Pass-By ⁴	30'	83.7	86.9	79.3	82.5
11	Scraper, Water Truck, & Dozer Activity ⁴	30'	79.7	87.7	75.3	83.3
12	Concrete Mixer Truck Movements ⁵	50'	71.2	73.1	71.2	73.1
13	Concrete Paver Activities ⁵	30'	70.0	75.7	65.6	71.3
14	Concrete Mixer Pour & Paving Activities ⁵	30'	70.3	76.3	65.9	71.9
15	Concrete Mixer Backup Alarms & Air Brakes ⁵	50'	71.6	78.8	71.6	78.8
16	Concrete Mixer Pour Activities ⁵	50'	67.7	79.2	67.7	79.2

TABLE 1: CONSTRUCTION REFERENCE NOISE LEVEL MEASUREMENTS SUMMARY

¹As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.

² As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.

³ As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.

⁴ As measured by Urban Crossroads, Inc. on 10/30/15 during grading operations within an industrial construction site located in the City of Ontario.

⁵ Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.

⁶ Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

MODELED AND MEASURED CONSTRUCTION NOISE LEVELS

A RCNM construction noise analysis was prepared by Urban Crossroads, Inc. on October 17th, 2014 for an industrial project site in the City of Ontario. The noise levels due to construction in the industrial portion of the project site (Planning Area 1) were estimated at up to thirteen receiver locations to determine the potential noise impacts at adjacent sensitive land uses. Returning to the same industrial project site over a year later, in October 2015, Urban Crossroads, Inc. collected noise level measurements at the same receiver locations to validate the modeled RCNM construction noise levels with actual construction noise level measurements collected in the field. The grading stage of construction was chosen for this comparison since grading activities typically represent the worst-case construction activities due to the number and size of the mobile equipment used in the grading process.



MODELED CONSTRUCTION NOISE LEVELS

As shown on Table 2, the modeled RCNM noise levels during the grading stage of construction were estimated to produce a noise level approaching 92.6 dBA Leq at a distance of 50 feet from the project site boundary. The RCNM noise levels reflect the combined construction noise level impacts of excavators, graders, tractors, loaders, backhoes, rubber tired dozers, and scrapers producing a noise level of 92.6 dBA Leq. At nearby receiver locations, this results in a short-term construction noise level approaching 88.2 dBA Leq.

Equipment Type ¹	Quantity	Usage Factor ²	Hours Of Operation ³	Reference Noise Level @ 50 Feet (dBA Leq)	Combined Level @ 50 Feet (dBA Leq)
Excavator	2	40%	3.2	81.0	80.0
Grader	8	40%	3.2	85.0	90.1
Tractor/Loader/Backhoe	5	40%	3.2	78.0	81.0
Rubber Tired Dozer	2	40%	3.2	79.0	78.0
Scraper	5	40%	3.2	84.0	87.0
	Со	mbined Hou	Irly Noise Levels	50 Feet (Leq dBA)	92.6

TABLE 2: RCNM MODELED CONSTRUCTION NOISE LEVELS

Receiver Location	Distance To Property Line (Feet) ⁴	Distance Attenuation (dBA Leq) ⁵	Estimated Noise Barrier Attenuation (dBA Leq)	Construction Noise Level (dBA Leq)
R2	83'	-4.4	0.0	88.2
R3	78'	-3.9	-5.6	83.1

¹ Source: FHWA's Roadway Construction Noise Model, January 2006.

² Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

³ Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

⁴ Distance from the nearest point of construction activity to the nearest receiver.

 $^{\rm 5}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.



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MEASURED CONSTRUCTION NOISE LEVELS

To describe the actual construction noise levels based on typical conditions, short-term construction noise level measurements were collected in the field during grading activities at receiver locations R2 and R3. Appendix C includes study area photos of the measurement locations and the construction activities observed from each location at the project site. To validate the construction noise levels, measurements were collected during continuous on-site grading activities on Friday, October 30th, and again on Friday, November 6th, 2015.

Grading activities observed on the site during the short-term noise level measurements include water trucks queuing and refilling at a stationary tank, trencher activity, up to three scrapers operating simultaneously, and dozer activity. The water truck queuing activity was the closest equipment observed near the project site boundaries due to the stationary location of the water refill tank, at a distance of approximately 100 feet from the receiver locations. The trencher was observed at a distance of roughly 600 feet from the receiver locations, and the scrapers and dozer activities were at approximately 900 feet from the receiver locations. Additional stationary scrapers were located at a distance of approximately 700 feet from the receiver locations. Additional background construction noise sources include forklifts, cranes, and man lifts used in the building construction stage of a portion of the site located roughly 900 feet southeast of the receiver locations. The construction activities observed during the short-term measurements represent typical grading activities within an industrial construction site, with multiple pieces of equipment operating at varying distances from the project site boundaries.

Table 3 shows the modeled RCNM noise levels using the actual distances from each receiver location to the nearest equipment activity observed during the short-term noise level measurements. Based on the RCNM model, the peak grading construction noise levels would range from 80.9 to 86.5 dBA Leq when equipment is located at 100 feet from each receiver location. By calculating the modeled RCNM noise level at each location, a comparison can be made between the modeled and measured grading construction noise levels to calibrate the construction noise model.



Equipment Type ¹	Quantity	Usage Factor ²	Hours Of Operation ³	Reference Noise Level @ 50 Feet (dBA Leq)	Combined Level @ 50 Feet (dBA Leq)
Excavator	2	40%	3.2	81.0	80.0
Grader	8	40%	3.2	85.0	90.1
Tractor/Loader/Backhoe	5	40%	3.2	78.0	81.0
Rubber Tired Dozer	2	40%	3.2	79.0	78.0
Scraper	5	40%	3.2	84.0	87.0
	Сог	mbined Hou	Irly Noise Levels	50 Feet (Leq dBA)	92.6

TABLE 3: MODELED CONSTRUCTION NOISE LEVELS BASED ON ACTUAL EQUIPMENT DISTANCES

Receiver Location	Distance To Closest Equipment Activity (Feet) ⁴	Distance Attenuation (dBA Leq) ⁵	Estimated Noise Barrier Attenuation (dBA Leq)	Construction Noise Level (dBA Leq)
R2	100'	-6.0	0.0	86.5
R3	100'	-6.0	-5.6	80.9

¹ Source: FHWA's Roadway Construction Noise Model, January 2006.

² Estimates the fraction of time each piece of equipment is operating at full power during a construction operation.

³ Represents the actual hours of peak construction equipment activity out of a typical 8 hour workday.

⁴ Distance from the nearest point of construction activity to the nearest receiver. ⁵ Daint (stationard) source drop off state of $C \cap dD$ and doubling of distance

 $^{\rm 5}$ Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.

To determine the project-only construction noise levels at each receiver location during the grading activities observed at the project site, the ambient without project noise level measurements are compared to the short-term with project noise level measurements. The ambient noise level measurements from the original noise study are shown on Table 4 in addition to the new short-term noise level measurements collected during typical grading activity at the receiver locations on Day 1, Friday, October 30th 2015. By subtracting the previous ambient noise level from the new combined (project construction plus ambient) noise level measurements at each receiver, the project-only construction noise levels can be logarithmically calculated. Table 4 shows the project-only construction noise levels ranged from 61.4 to 63.4 dBA Leq, and are significantly lower than those modeled with the RCNM at the same receiver locations.

Based on the Day 1 analysis, the differences between the peak RCNM model and typical measured construction noise levels range from 19.6 to 23.2 dBA Leq. This analysis demonstrates how the RCNM overstates the potential construction noise level impacts by placing all equipment at a single point at the project site boundary. In reality, the grading equipment within the project site was observed to operate in different locations throughout the project site. In addition, the typical construction noise levels



measured at the receiver locations reflect modern construction equipment noise level emissions that are largely overstated using the older RCNM reference noise levels.

01	riginal Noise Stu	dy		Calibr	ation	
Receiver Location ¹	Measured Daytime Ambient Noise Levels (dBA Leq) ²	Peak Modeled RCNM Grading Construction Noise Levels (dBA Leq) ³	Calculated RCNM Noise Levels to Closest Observed Equipment (dBA Leq) ⁴	Measured Typical Grading Construction Noise Levels at Receivers (dBA Leq) ⁵	Calculated Project-Only Construction Noise Levels (dBA Leq) ⁶	Difference Between Modeled & Measured Noise Levels (dBA Leq) ⁷
R2	70.3	88.2	86.5	71.1	63.4	23.2
R3	68.3	83.1	80.9	69.1	61.4	19.6

TABLE 4: DAY 1 CONSTRUCTION NOISE LEVEL COMPARISON

¹ Receiver locations from the construction noise analysis which are closest to the Planning Area 1 construction activities.

² Ambient noise level measurements taken on 3/13/14 at the receiver locations during the Ontario industrial project noise study.

³ Estimated construction noise levels based on the RCNM peak construction noise analysis methodology. These conditions are not likely to occur as the RCNM assumes all equipment is operating simultaneously at a single point at the project site boundary.

⁴ Modeled RCNM construction noise levels at each receiver location based on the observed distance to the nearest construction equipment activity during the noise level measurements, shown on Table 3.

⁵ Measured noise levels at the receiver locations during one hour of typical grading activities in the center of the construction site.

⁶ Project only construction noise levels calculated based on the logarithmic noise level difference between the measured noise levels during grading activity and the ambient without project noise levels measured at each receiver location.

⁷ Difference between the peak RCNM modeled noise levels and the typical noise levels measured at the receiver locations during typical grading activities.

Similarly, the Day 2 short-term construction noise level measurements are shown on Table 5 in relation to the RCNM modeled noise levels. Table 5 shows the project-only construction noise levels ranged from 64.1 to 65.3 dBA Leq, and are significantly lower than those modeled with the RCNM at the same receiver locations. Based on the Day 2 analysis, the differences between the peak RCNM model and typical measured construction noise levels range from 16.8 to 21.2 dBA Leq. This Day 2 analysis is consistent with the Day 1 typical grading construction noise level measurements taken a week later at the same receiver locations.



01	riginal Noise Stu	dy		Calibi	ration	
Receiver Location ¹	Measured Daytime Ambient Noise Levels (dBA Leq) ²	Peak Modeled RCNM Grading Construction Noise Levels (dBA Leq) ³	Calculated RCNM Noise Levels to Closest Observed Equipment (dBA Leq) ⁴	Measured Typical Grading Construction Noise Levels at Receivers (dBA Leq) ⁵	Calculated Project-Only Construction Noise Levels (dBA Leq) ⁶	Difference Between Modeled & Measured Noise Levels (dBA Leq) ⁷
R2	70.3	88.2	86.5	71.5	65.3	21.2
R3	68.3	83.1	80.9	69.7	64.1	16.8

TABLE 5: DAY 2 CONSTRUCTION NOISE LEVEL COMPARISON

¹ Receiver locations from the construction noise analysis which are closest to the Planning Area 1 construction activities.

² Ambient noise level measurements taken on 3/13/14 at the receiver locations during the Ontario industrial project noise study.

³ Estimated construction noise levels based on the RCNM peak construction noise analysis methodology. These conditions are not likely to occur as the RCNM assumes all equipment is operating simultaneously at a single point at the project site boundary.

⁴ Modeled RCNM construction noise levels at each receiver location based on the observed distance to the nearest construction equipment activity during the noise level measurements, shown on Table 3.

⁵ Measured noise levels at the receiver locations during one hour of typical grading activities in the center of the construction site.

⁶ Project only construction noise levels calculated based on the logarithmic noise level difference between the measured noise levels during grading activity and the ambient without project noise levels measured at each receiver location.

⁷ Difference between the peak RCNM modeled noise levels and the typical noise levels measured at the receiver locations during typical grading activities.

CONCLUSIONS

The sample reference noise level measurements were taken by Urban Crossroads, Inc. in order to better describe the noise levels from various typical construction activities at different land use types. To quantify the difference between the modeled RCNM and measured construction noise levels in the field, Urban Crossroads, Inc. compared the modeled results of a RCNM construction noise level analysis with the actual measured noise levels observed in the field during typical grading activities at the same project site. While the RCNM equipment database and methodology provides conservative, worst-case, construction noise levels for specific pieces of equipment, our field measurements show how the RCNM methodology overstates the noise levels experienced at the nearby receiver locations during actual construction activities.

This analysis demonstrates how the RCNM overstates the potential construction noise level impacts by placing all equipment at a single point at the project site boundary. In reality based on our observations in the field, the grading equipment within the project site was observed to operate at different locations throughout the project site. In addition, the typical construction noise levels measured at the receiver locations reflect modern construction equipment noise level emissions that are largely overstated using the older RCNM reference noise levels. The reference noise level measurements presented in this memo are, therefore, representative of typical construction noise levels to accurately describe potential construction noise impacts at nearby receiver locations for a given project. This memo presents typical construction activity reference noise levels. Detailed site specific analysis is needed to assess potential



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construction noise level impacts at nearby sensitive receiver locations on a project by project basis and to identify the appropriate mitigation measures as needed at future construction sites.

Prepared by:

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APPENDIX A

REFERENCE NOISE LEVEL MEASUREMENTS SUMMARY TABLE



Appendix A

dBA Lmax 84.6 72.0 70.4 70.5 80.4 72.3 77.9 85.5 82.5 83.3 71.3 71.9 78.8 63.7 73.1 79.2 **Reference Noise** @ 50 Feet Levels dBA Leq 79.0 65.6 71.6 59.2 64.2 67.5 68.2 73.5 62.3 71.9 79.6 79.3 75.3 71.2 62.9 67.7 dBA Lmax 74.8 74.9 84.8 82.3 89.9 89.0 86.9 79.2 76.4 76.7 76.3 78.8 68.187.7 73.1 75.7 **Voise Levels** Reference dBA Leq 63.6 68.6 71.9 72.6 77.9 83.4 70.0 70.3 71.6 76.3 84.0 71.2 67.7 66.7 83.7 79.7 From Source Reference Distance (Feet) 30' 30' 30' 30' 30' 30' 30' 50' 30' 30' 50' 30' 30' Measurement Reference Duration (h:mm:ss) 0:02:00 0:01:15 0:01:01 0:05:00 0:00:32 0:01:00 1:00:00 0:01:00 0:01:00 0:00:45 0:00:32 0:00:30 0:30:00 0:01:00 0:01:00 0:00:20 Trenching, Building Const. Building Const., Paving Building Const. Construction Grading Grading Grading Grading Grading Stage(s) Grading Grading Grading Grading Typical **Business Park Business Park** (Land Use) Residential Residential Residential Residential Industrial Type of Project **Construction Vehicle Maintenance Activities** Concrete Mixer Backup Alarms & Air Brakes Concrete Mixer Pour & Paving Activities Scraper, Water Truck, & Dozer Activity Water Truck Pass-By & Backup Alarm Two Scrapers & Water Truck Pass-By **Reference Source Concrete Mixer Truck Movements** Truck Pass-Bys & Dozer Activity **Concrete Mixer Pour Activities Concrete Paver Activities Rough Grading Activities** Foundation Trenching Two Scrapers Pass-By Residential Framing Dozer Activity Dozer Pass-By 16 15 14 10 ≙ m ഹ 9 ∞ თ 11 12 13 2 4

Construction Equipment Reference Noise Levels





APPENDIX B

REFERENCE NOISE SOURCE PHOTOS







1.1_TruckPass-By&DozerActivity 33, 39' 0.101600", 117, 43' 56.773600"



2.1_DozerActivity 33, 39' 0.101600", 117, 43' 56.773600"



3.1_ConstructionVehicleMaintenance 33, 31' 16.600000", 117, 36' 58.060000"



4.1_FoundationTrenching 33, 32' 8.530000", 117, 35' 55.490000"



4.2_FoundationTrenching 33, 32' 8.540000", 117, 35' 55.710000"



5.1_RoughGradingActivities 33, 31' 16.710000", 117, 37' 0.530000"



5.2_RoughGradingActivities 33, 31' 16.600000", 117, 37' 0.450000"



5.3_RoughGradingActivities 33, 31' 16.570000", 117, 37' 0.450000"



5.4_RoughGradingActivities 33, 31' 16.660000", 117, 37' 0.310000"



6.1_ResidentialFraming 33, 32' 15.610000", 117, 36' 2.740000"



7.1_WaterTruckPassBy&BackupAlarm 34, 4' 19.318500", 117, 36' 25.015800"

8.1_DozerPass-By 34, 4' 19.373400", 117, 36' 24.988400"



9.1_TwoScrapers&WaterTruckPass-By 34, 4' 19.332200", 117, 36' 24.988400"

10.1_TwoScrapersPass-By 34, 4' 19.373400", 117, 36' 25.070800"



10.2_TwoScrapersPass-By 34, 4' 19.373400", 117, 36' 25.070800"



11.1_Scraper,WaterTruck,&DozerActivity 34, 4' 19.373400", 117, 36' 25.070800"



11.2_Scraper,WaterTruck,&DozerActivity 34, 4' 19.318500", 117, 36' 25.125700"

11.3_Scraper,WaterTruck,&DozerActivity 34, 4' 19.346000", 117, 36' 25.043300"



11.4_Scraper,WaterTruck,&DozerActivity 34, 4' 19.291000", 117, 36' 25.070800"

12.1_ConcreteMixerTruckMovements 34, 4' 43.200000", 117, 12' 25.779400"





13.1_ConcretePaverActivities 34, 4' 43.625700", 117, 12' 25.312500"

14.1_ConcreteMixerPour&PavingActivities 34, 4' 42.746800", 117, 12' 24.955400"



15.1_ConcreteMixerBackupAlarms&AirBrakes 34, 4' 43.666900", 117, 12' 24.763100"

16.1_ConcreteMixerPourActivities 34, 4' 43.158800", 117, 12' 25.944200"

APPENDIX C

SHORT-TERM MEASUREMENTS & CONSTRUCTION ACTIVITY PHOTOS





ConstructionSite_1 34, 4' 39.808000", 117, 36' 22.955900"

ConstructionSite_2 34, 4' 39.808000", 117, 36' 22.955900"



ConstructionSite_3 34, 4' 39.533300", 117, 36' 23.312900"

ConstructionSite_4 34, 4' 39.533300", 117, 36' 23.312900"



ConstructionSite_5 34, 4' 39.341100", 117, 36' 28.064500"

ConstructionSite_6 34, 4' 39.684400", 117, 36' 23.477700"



ConstructionSite_7 34, 4' 39.684400", 117, 36' 23.477700"

R2 34, 4' 39.341100", 117, 36' 28.064500"



R2_South 34, 4' 39.217500", 117, 36' 29.108200"

R2_Southwest 34, 4' 39.217500", 117, 36' 29.108200"



R2_Southwest2 34, 4' 39.505900", 117, 36' 28.970900"

R2_West 34, 4' 39.217500", 117, 36' 29.108200"



R3 34, 4' 39.972800", 117, 36' 16.803500"

R3_E 34, 4' 39.972800", 117, 36' 16.803500"



R3_South 34, 4' 39.972800", 117, 36' 16.803500"

R3_South2 34, 4' 39.519600", 117, 36' 17.050700"



R3_South3 34, 4' 39.698100", 117, 36' 14.221800"

R3_Southeast 34, 4' 39.698100", 117, 36' 14.221800"



R3_Southwest 34, 4' 39.972800", 117, 36' 16.803500"
APPENDIX 10.2:

CONSTRUCTION TEMPORARY NOISE BARRIER ATTENUATION CALCULATIONS



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STATIONARY SOURCE NOISE PREDICTION MODEL

Observer Location: R6

Source: Demolition through Landscaping Condition: Construction

Project Name: Knox Business Park Job Number: 9349 Analyst: A. Wolfe

NOISE MODEL INPUTS Barrier Height: Noise Distance to Observer 191.0 feet 6.0 feet Noise Source Height: 8.0 feet Noise Distance to Barrier: 10.0 feet Observer Height: 5.0 feet Barrier Distance to Observer: 181.0 feet Barrier Type (0-Wall, 1-Berm): 0 Observer Elevation: 1,599.0 feet

Noise Source Elevation: 1,595.0 feet Barrier Elevation: 1,599.0 feet Drop Off Coefficient: 20.0

20 = 6 dBA per doubling of distance 15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS							
Noise Level	Distance (feet)	Leq	L50	L25	L8	L2	Lmax
Reference (Sample)	50.0	79.6	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	191.0	-11.6	-11.6	-11.6	-11.6	-11.6	-11.6
Shielding (Barrier Attenuation)	10.0	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7
Raw (Distance + Barrier)		61.3	-18.3	-18.3	-18.3	-18.3	-18.3
60 Minute Hourly Adjustment		61.3	-18.3	-18.3	-18.3	-18.3	-18.3

11/30/2015

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